# Temporal and spatial variations in the geochemistry of recent (<2ka) volcanic rocks from Vulcano, Aeolian Islands, Italy

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# Declaration of Authorship

I **Anna Victoria Todman** hereby declare that this thesis and the work presented in it is entirely my own. Where I have consulted the work of others, this is always clearly stated.

Signed: ________________________

Date: __________________________

# Abstract

The eruptive history of Vulcano originally helped define classic "Vulcanian" eruption styles - short periods of explosive vent-clearing then effusive activity, followed by longer periods of quiescence. Recent research has shown that the magma plumbing system below Vulcano (consisting of La Fossa and Vulcanello eruptive centres) comprises two magma systems: a shallow, evolved, felsic magma and a deep, less evolved mafic magma (Gioncada et al, 2003; Peccerillo et al, 2006). The main objective of this research is to understand the geochemistry of the recent (<2 ka) eruptive activity at Vulcano in both space and time.

The chronostratigraphy of La Fossa and Vulcanello was revised following a review of previously published ages and the incorporation of new $^{14}C$ ages derived from charcoal collected during fieldwork. Using the refined chronostratigraphy, whole rock (ICP-AES & ICP-MS) samples from both explosive pyroclastic and effusive deposits were analysed. The variations seen in these results were then further investigated using EMPA and LA-ICP-MS analysis of the individual glass shards.

Finally zoned clinopyroxene phenocrysts were examined in detail through major, minor and trace elements analyses. The analyses showed that there are marked and systematic changes in the composition across the crystals, and the zoning seen clearly supports the theory that two different magma compositions are present beneath the island of Vulcano. Temporal variations can be seen in the phenocrysts similar to those seen in the different eruptive cycles of La Fossa and Vulcanello.

References

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## List of Abbreviations Used

AFC – assimilation fractional crystallisation

BSE – back-scattered electrons

BP – before present (1950)

CA - calc-alkaline series

CPX – clinopyroxene

DEMF – Direction of Earth’s Magnetic Field

EMPA - electron microprobe analysis

FC – fractional crystallisation

HFSE – high field strength elements

HKCA – high-K calc-alkaline series

KS – potassic series

ICP-AES – Inductively coupled plasma atomic emission spectroscopy

ICP-MS - Inductively Coupled Plasma Mass Spectroscopy

LA-ICP-MS – Laser Ablation Inductively Coupled Plasma Mass Spectroscopy

LILE – large ion lithophile elements

MORB – mid ocean ridge basalt

PCA – Principal Component Analysis

REE – rare earth elements

SEM – scanning electron microscope

SHO – shoshonitic series

VLP – Vulcanello Lava Platform

# Chapter 1: Introduction and Overview

## 1.1 Introduction

Generally, previous research about Vulcano has investigated the temporal changes in the petrology and chemistry over timescales of 100 Ka to 1 Ma years, however, this research project focuses on only the recent (<2 Ka) history at the La Fossa and Vulcanello eruptive centres on Vulcano and their small - scale cyclicity. In order to do this, this project will geochemically analyse the explosive and effusive products from both La Fossa & Vulcanello. This will mean that a diagnostic geochemical 'fingerprint' of both the explosive and effusive products can be established, which in turn should lead to the different phases of the eruptions being able to be identified.

## 1.2 Thesis Structure

An evaluation of the magmatic processes affecting Vulcano is presented in **Chapter 2**. This includes an extensive review of literature pertaining to the geological setting of Vulcano and the Aeolian Arc, specifically focussing on the La Fossa cone and the peninsula of Vulcanello. Magma mixing, zoning in phenocrysts and previously published work on melt inclusions is also reviewed in this chapter. **Chapter 3** focuses on the chronostratigraphy of the La Fossa and Vulcanello deposits, reviewing previously published ages for a variety of methodologies including archaeomagnetic dating and Ra-Th dating. This chapter also presents some new $^{14}C$ ages from charcoal collected during fieldwork and evaluates their implications on the previously accepted ages of the eruptive cycles.

**Chapter 4** presents interpretations of the whole rock geochemical evolution of the La Fossa and Vulcanello explosive and effusive deposits, and draws conclusions on the source characteristics of the deep mantle processes occurring beneath Vulcano as well as shallow crustal processes which are also seen. Chapter 4 then uses glass analysis to better understand the processes and trends seen in the whole rock analysis. **Chapter 5** begins with a general overview of the minerals found within the different deposits from La Fossa and Vulcanello and then examines in more detail the zoned clinopyroxene phenocrysts which were found in several of the eruptive units. **Chapter 6** summarises the important conclusions, from Chapters 3, 4 and 5, of the magmatic evolution of the recent eruptions at La Fossa and Vulcanello on Vulcano, Italy.

Details of the collection of charcoal from the field and the subsequent $^{14}C$ analysis are presented in **Appendix A**. A sample catalogue, detailing all the samples used in this research along with the location that they were collected from is detailed in **Appendix B. Appendix C** contains a complete list of the results and sample preparation and analysis of ICP-AES and ICP-MS. It also contains details on the standards used during the analyses. Sample preparation and the methodology of the EMPA glass analysis carried out at Oxford are outlined in **Appendix D**. It also contains a full list of the data obtained as well as the secondary standards used during the analysis. **Appendix E** contains methodology and results of the glass samples and standards obtained during LA-ICP-MS analysis of individual shards. The results of the PCA analysis are detailed in **Appendix F**. Major, minor and trace element data (EMPA and LA-ICP-MS) for the zoned clinopyroxenes are listed in **Appendix G**.

# Chapter 2: Petrogenetic evolution of Vulcano

## 2.1 Introduction

The Aeolian Island of Vulcano (Italy) comprises a main composite volcano (La Fossa) and a parasitic cone to the NW (Vulcanello) (De Astis et al, 1997). The main objective of this research is to understand the eruptive activity at La Fossa and Vulcanello, Vulcano, Italy in both space and time. The eruptive history of Vulcano is generally that of short periods of explosive eruptions separated by long periods of quiescence (Guest et al. 2003). Defining the exact changes in the pattern of the eruptions has important implications for geohazards and the prediction of future eruptions on the populated Aeolian Islands, as it has long been recognised that the best way to forecast the future eruptions of any volcano is to first understand its past eruptive frequency and style (Cortese et al. 1986).

Recent research has shown that the magma plumbing system below the La Fossa vent on Vulcano is made up of two magma systems: a shallow, evolved, felsic component and a deeper, less evolved, mafic component (Gioncada et al. 2003, Peccerillo et al. 2006). The difference in these magma systems is thought to lead to more explosive rhyolitic activity at La Fossa and more effusive basaltic activity at Vulcanello, a cone situated to the north of La Fossa (Peccerillo et al. 2006).

To date, most studies of Vulcano have investigated the temporal changes in the petrology and chemistry over timescales of 100 Ka to 1 Ma years (De Astis et al, 2000, Gioncada et al, 2003). This research project focuses on only the recent (<2 ka) history at the La Fossa and Vulcanello eruptive centres on Vulcano and their small - scale cyclicity. In order to do this, this project will geochemically analyse the explosive and effusive products from both La Fossa & Vulcanello. This will mean that a diagnostic geochemical 'fingerprint' of both the explosive and effusive products can be established, which in turn should lead to the different phases of the eruptions being able to be identified.

This chapter is an overview of previous work on La Fossa and Vulcanello, as well as the most recent eruption from the adjacent island of Lipari (720 ±40 BP) because the fall deposits from the Monte Pilato eruption from Lipari are found on Vulcano. The chapter will also consider recent work on magma mixing and zoned phenocrysts.

## 2.2 Geological Setting

### 2.2.1 Aeolian Island Arc

The Aeolian Island archipelago situated within the Tyrrhenian Sea, roughly 25 km north of Sicily, comprises seven volcanic islands (from east to west: Stromboli, Panarea, Vulcano, Lipari, Salina, Filicudi and Alicudi) (Fig 2.1a) and nine submarine seamounts which extend both to the northeast and west of the subaerial part of the island arc (De Astis et al. 2000; Zanon et al. 2003; Blanco - Montenegro et al. 2007; Chiarabba et al. 2008). Activity began roughly 1 Ma in the west of the arc (Filicudi and the submarine seamount of Sisfo) and only two of these islands are currently active (Vulcano and Stromboli) with a further, Lipari, having a record of historical eruptions (Barberi et al. 1974).

The Aeolian Islands formed as a result of the convergence of the African and European plates (Barberi et al. 1974). More precisely, it was the subduction of the Ionian slab beneath the Calabro-Peloritani continental margin that generated the magmatic arc (Zanon et al 2003). The Aeolian archipelago located between the southern Tyrrhenian Sea backarc basin and the Sicilian - Calabrian continental forearc region is most often described as an island arc (Ventura 1994; Zanon et al 2003). However, Ellam et al (1988) describe the arc as having an only vaguely arcuate structure, and Blanco-Montenegro et al (2007) disagree and state that when taking into account the submarine seamounts as well as the islands it forms a ring-shaped structure not an arc.

Ellam et al (1988) suggest that the volcanic activity of the whole area may be due to a NW dipping Benioff zone. The zone is steeply inclined and evolution of Aeolian Island volcanism is thought to be related to the rapid deepening of this zone (Barberi et al. 1974). As well as seismic data, gravimetric along with heat flow data show that the active marginal basin within the Tyrrhenian Sea has a similar structure to a sinking slab with limited lateral extension to the inter-arc basins of the western Pacific, (Barberi et al. 1974). Figure 2.1b shows how the subduction of this Ionian slab, beneath the Tyrrhenian Sea, is indicated by the focal depths of earthquakes and this seismic zone has an estimated dip of 50-70° to a depth of 500 km (Chiarabba, et al 2008).

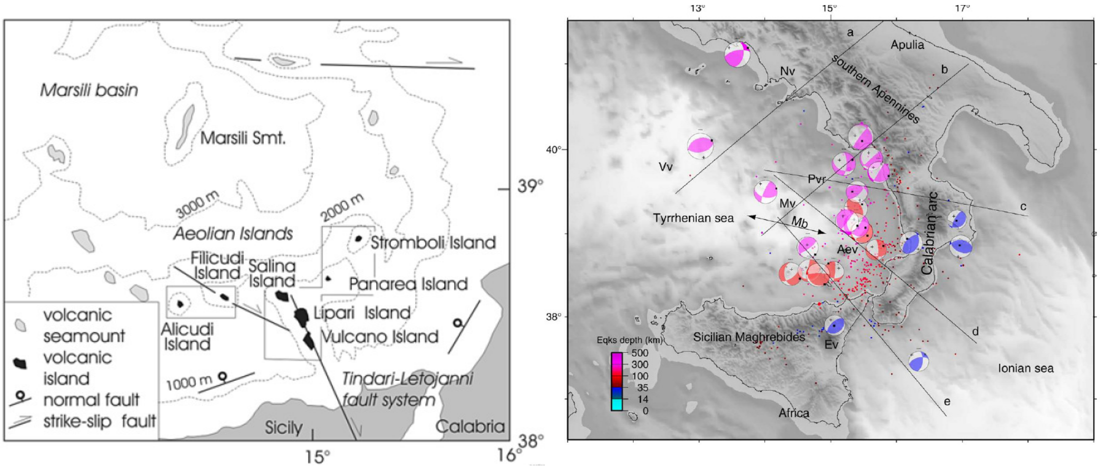


Figure 2.1a: The main fault systems of the Aeolian Islands and the location of the Tindari - Letojanni fault system which trends through Vulcano and Lipari (Favalli et al. 2005). 2.1b: The subduction of the Ionian lithosphere indicated by the focal mechanisms of earthquakes in the region (Chiarabba et al. 2008).

Chiarabba et al (2008) found through their modelling of the southern Tyrrhenian subduction zone that the two high-velocity bodies modelled within the mantle at 150–300 km depth, and the Neapolitan and Aeolian arc areas of active (subduction-type) volcanism matched perfectly. As well as this, they found that a 150 km slab window formed beneath the southern Apennines and this explains why no volcanism occurs in this region. It is the formation of the slab window that is thought to have caused the fast retreat of the Ionian slab and in turn formed the back arc Marsili Basin. Between 2.1 and 1.6 Ma, the Marsili Basin is thought to have been spreading at a rate of up to 19 cm/year (Chiarabba, et al 2008). However, high - resolution seismicity studies have found a gap at a shallow depth of between 30 and 100 km which has led to the hypothesis that subduction within the Aeolian arc has now ceased (Guest et al. 2003). The exhumed outer parts of this arc can be found within the metamorphic rocks of Calabria and northern Sicily and a low-gravity belt is thought to correspond to a sediment-filled trench which can be found along the plate boundary (Barberi et al. 1974).

As well as subduction, the southern Tyrrhenian Sea is also affected by several large faults. The islands of Salina, Lipari and Vulcano lie on a ridge which has developed along a NW-SE trending right-lateral strike-slip fault (Blanco-Montenegro et al. 2007). This fault is part of larger tectonic feature, the Tindari - Letojanni strike-slip fault, which outcrops in north eastern Sicily.

Figure 2.1a also shows the location of the Tindari-Letojanni strike-slip fault, which runs through Vulcano, Lipari and Salina in a general NW-SE direction. Two other strike-slip faults affect the Aeolian Island region: one which runs NW-SE in the west of the island arc through

Filicudi, Alicudi and the western seamounts, and the other which has a generally W-E lineament to the north of the islands.

The magmatism of the Aeolian Islands has a very varied composition and calc-alkaline (CA), high-K calc-alkaline (HKCA), shoshonitic (SHO) and undersaturated potassic (KS) rocks have all been found on the islands (Ellam et al, 1988, Crisci et al, 1991a, De Astis et al. 2000). Figure 2.2 shows a $K_2O$ vs. $SiO_2$ diagram for effusive deposits from some of the islands (Salina, Vulcano and Stromboli). Previous authors generally agree that the range of magma compositions is due to the fact that several different sources and multi-component processes are involved in the formation of the Aeolian Islands (De Astis et al. 2000). Convergent plate margin tectonics typically generates calc-alkaline and shoshonite volcanism and it has been suggested that the more potassium enriched rocks are due to fluctuations in the amount the mantle source has been metasomatised (De Astis et al. 2000). The mantle is probably also enriched with basaltic ocean crust and previously subducted sediments (Ellam & Harmon 1990). As well as the magmas being derived from a variety of sources, further variation in the composition of the Aeolian Island deposits is due to the occurrence of fractional crystallisation (FC) and assimilation fractional crystallisation (AFC) (Ellam & Harmon 1990).

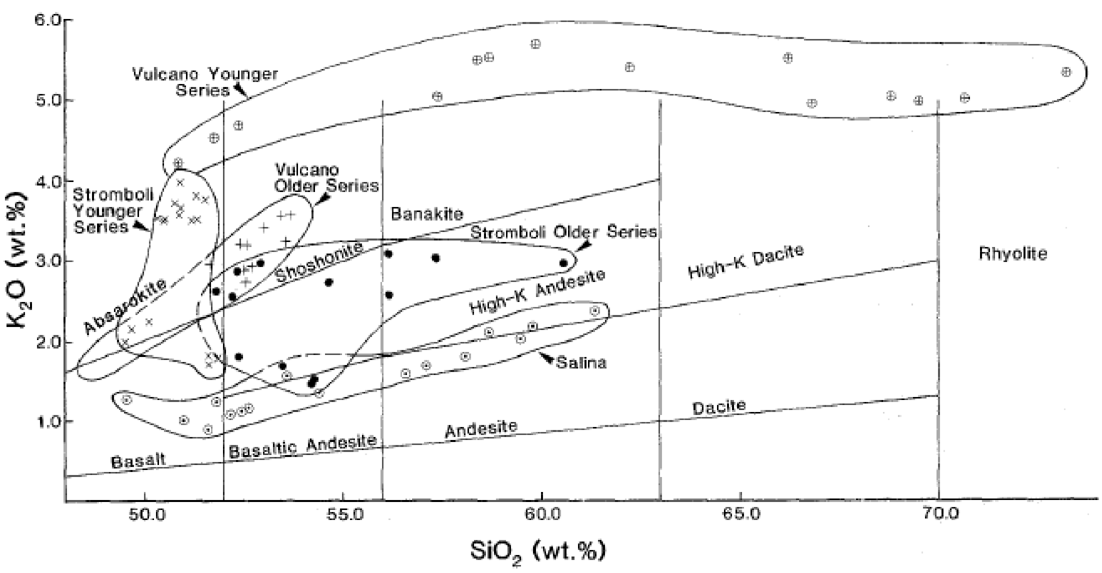


Figure 2.2: Plot of K2O vs. SiO2 for some of the Aeolian Island lava series (Ellam et al. 1988).

Generally the older parts of the arc are formed of rocks that belong to the CA (Salina) or the HKCA series (Alicudi, Filicudi and Lipari). The younger, more recently formed islands also contain rocks that belong to the SHO or KS series (Stromboli and Vulcano) (Crisci et al. 1991a). The fact that the subducting crust is continental and that shoshonitic rocks are found on both sides of the plate boundary may suggest that the subduction process has almost come to an end and that the Aeolian arc is now in a senile stage of evolution (Barberi et al. 1974), which also ties in with the findings from high-resolution seismic studies. However, as Guest et al (2003) point out: the Aeolian Islands are only 1 Ma, which in tectonic terms is considered very young, so very rapid development of the volcanic arc is required to have taken place for this to be the case.

The volcanic rocks on the Aeolian Islands associated with the CA series can be split into three distinct groups on the basis of geochemistry. The first group is made up of the oldest islands of Alicudi and Filicudi in the west of the arc, the second group are islands from the central part of the arc (Salina, Lipari and Panarea) and the third group from the younger, north eastern part, the Stromboli suite. Francalanci et al (1993) grouped the islands using geochemical and isotopic data, as they found that the three groups had quite distinct incompatible element abundances and isotopic ratios. Generally, they found that the western, older group of Alicudi and Filicudi had lower values of the large ion lithophile elements (LILE) as well as certain incompatible element ratios including Ba/La and Zr/Nb. These values and ratios increased towards the central part of the arc and at the same time the high field strength elements (HFSE) of Th, U, Ta etc decreased (Francalanci et al. 1993). As well as this, the rare earth elements (REE) also have lower abundances in the volcanic rocks from the central group than the western group although the opposite variations can be seen in the younger Stromboli suite. This variation has been attributed to the possibility that the mantle source similar to the MORB source has been metasomatised by slab derived, crustal contaminants (Francalanci et al. 1993).

The strontium ($^{87}Sr/^{86}Sr$) ratios of the CA rocks from the Aeolian Islands generally increase from the older, western part of the arc to the younger, north eastern islands and are well correlated with the neodymium ($^{143}Nd/^{144}Nd$) ratios (Francalanci et al. 1993). These isotope variations indicate that the proportion of crustal material within the mantle source increases from west to north – east. Francalanci et al (1993) conclude that as the three different groups lie in different parts of the arc, they possibly indicate that there are large local variations in the pressure and temperature of the subducting slab, with the central group having a mantle source with a higher hydrous fluid / melt ratio than either the western or north eastern groups.

### 2.2.2 Vulcano

Vulcano is the southernmost and third largest of the seven Aeolian islands and is situated about 25km north of Sicily, lying on the NNW-SSE trending Tindari - Letojanni strike-slip fault. The NNW-SSE trending Tindari - Letojanni strike-slip fault beneath Vulcano is thought to be responsible for the northward progression of the volcanic activity on Vulcano (Del Moro et al. 1998) from south to north. The main island evolved by various stages of stratocone construction and caldera collapse during the Pleistocene and Holocene (Arrighi et al. 2006).

Figure 2.3 shows the main geological features of the island of Vulcano. It can broadly be divided into four parts.

1) The oldest part of the island is in the south and is made up of a circular composite volcano, which has strata dipping towards the sea at angles of up to 40° on all sides (Keller 1980, Guest et al. 2003). The Piano Caldera has been dated as having been infilled over a long time, between 98 and 8 ka BP. The Piano Caldera has been mostly infilled with trachybasalts and tephrites (Guest et al, 2003).

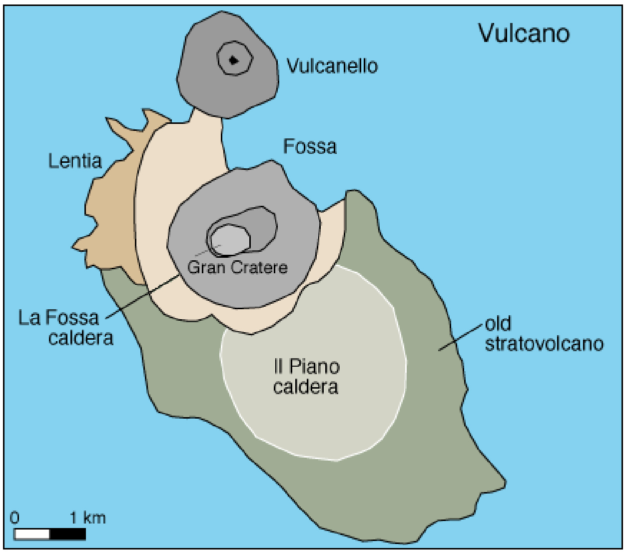


Figure 2.3: Simplified geologic sketch-map of Vulcano showing the key features of the island (after Keller, 1980)

2) The next part of the island is the Lentia Complex which together with the Mastro Minico has been dated as forming between 16.1 and 15.5 ka BP in the northwest of the island.

3) The second caldera to form on Vulcano is the La Fossa Caldera and it is thought to have formed soon after the Lentia complex (Keller 1980, Guest et al, 2003). De Astis et al (2000) found that activity occurred around the La Fossa caldera about 15 Ka. This

caldera is the present location of the active volcanic centre, the La Fossa cone. The broad cone is roughly 2km diameter at its base and has a maximum elevation of 391m on the eastern rim (Arrighi et al. 2006). The cone formed less than 6000 years ago with the most recent eruption occurring between 1888 and 1890 (De Astis et al. 2000, Gioncada et al. 2003). Currently there are active fumaroles on the northern side of the crater rim.

4) Vulcanello, about 2.5 km north of the main La Fossa Cone, forms a discrete sub-aerial volcano. There is some debate about when Vulcanello first formed, (see Chapter Three), and based on observations and writing from the Classical period, the island probably emerged from the sea only to be eroded away again several times before finally forming. Vulcanello became connected to the main island of Vulcano in about 1550, by a flat isthmus of sedimentary deposits (Guest et al, 2003).

Since the main focus of this thesis are the La Fossa crater and Vulcanello peninsular, and their explosive and effusive products, a more detailed review of these products follows. Since 1890, the La Fossa crater has been in a state of vigorous fumarolic activity, evolving B, Br, $CO_2$, $H_2S$, HCl, HF and $SO_2$ gases, and depositing ammonium sulphide and sulphur crystals (Guest et al. 2003). Aiuppa et al (2007) have been carrying out real-time monitoring of the mercury in the La Fossa fumaroles. They found that the $Hg/SiO_2$ ratios in the gases from the fumaroles varied by an order of magnitude over short times scales. As well as these changes in the chemistry of the gas, the temperature of the fumaroles can also vary between 100 – 600 °C (Guest et al, 2003). Clocchiatti et al (1994) report that the active La Fossa cone has been in a state of heightened unrest since 1987 and that the fumaroles recorded a temperature of 300 °C in 1987 and one of 700 °C in 1993.

Figure 2.4 shows a generalised log of these main eruptive units produced by Del Moro et al. (1998). These main eruptive units are summarised below with an indication of the alternation between explosive and effusive episodes.

- The **Punte Nere** – Oldest of the recent cycles of activity and includes dry surge beds overlain by a thick fall sequence (explosive). The final stage of the cycle was a trachytic lava flow (effusive), which was dated as 5500 ±1300 years BP by K/Ar dating (Frazzetta et al, 1984). The Varicoloured Tuffs succession overlays this and consists of the Campo Sportivo lava flow (effusive), which was also dated by K/Ar dating as 4600 ±1300 years BP (Frazzetta et al, 1984), and an explosive pyroclastic unit.

- The **Palizzi** Cycle – The figure shows alternating effusive and explosive products. The oldest part of this cycle includes pyroclastic deposits of trachytic and latitic to rhyolitic composition. The middle lava unit of this cycle is undated but the upper composite unit is characterised by surge beds (explosive) and a well-developed trachytic lava flow (effusive) that nearly reached the southern foot of the Fossa cone. This Palizzi flow was dated to 1600 ±1000 years BP by K/Ar methods, (Frazzetta et al, 1984) and to 1500 ±200 years BP using Ra/Th methods (Voltaggio et al. 1995).
- The **Commenda** Cycle – began with a small rhyolitic to latitic pyroclastic unit, and ended with a large visually distinctive pyroclastic unit of fine ash layers known as the 'Varicoloured Ashes'. The age of this cycle has traditionally been dated as 785 AD (although no evidence from K/Ar or Ra/Th methods as to where this date comes from) (Arrighi et al. 2006).
- The **Pietre Cotte** Cycle – also includes the most recent 1888-90 eruption. The pyroclastic deposits (explosive) have a latitic composition at the start of the cycle and later become more rhyolitic. The lava flow unit is a rhyolitic, obsidian flow that is morphologically very fresh and is thought to have been extruded at the end of the 1731 – 1739 period of activity (Frazzetta et al. 1984).
- **Vulcanello I, II and III** including the Roveto lava flow. This formed as a separate island and has traditionally been dated as the Vulcanello I and II cones along with the lava platforms as having formed in 183 BC. Carbon 14 dating on organic matter from the Vulcanello III tuff cone has given an age of 325±100 years BP (Keller, 1980; Arrighi et al*,* 2006). Up until the end of the 19$^{th}$ century weak fumarolic activity could be seen within this crater (Arrighi et al 2006).
- The **Monte Pilato** deposits from **Lipari** are also shown on Figure 2.4 as they form a useful stratigraphic marker layer on both La Fossa and Vulcanello.

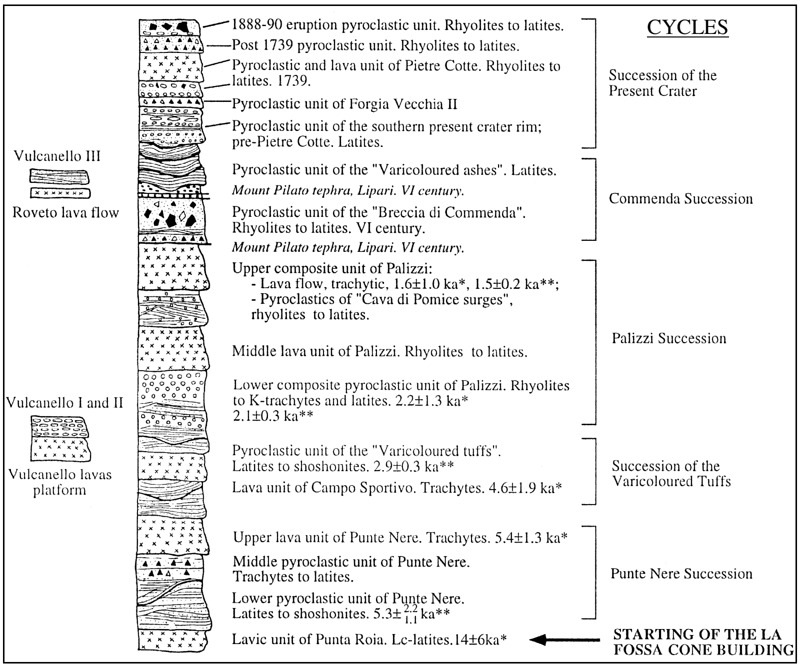

Figure 2.4: A log of the main eruptive units (Del Moro et al. 1998)

As summarised above it is clear that each of the eruptive units contains eruptive products indicative of a "cycle" characterised by:

1. Quiescent stage (characterised by erosional unconformities)
2. Explosive eruptions (surge deposits)
3. Explosive explosions (lithic rich deposits)(i.e. Vulcanian style )
4. Effusive eruption (viscous lava flows)

It is not currently known how quickly the various stages occur within a cycle but no paleosols or erosional unconformities have been found within the cycle suggesting that they may occur rapidly. However, erosional unconformities do occur between the different cycles suggesting a volcanic hiatus (Frazzetta et al. 1983). La Fossa is currently in a quiescent stage, although there have been (Frazzetta et al. 1984) some short periods of heightened unrest in the 1980s and 1990s.

Within each cycle the products show various similarities. They begin with surge beds, and are overlain by fall deposits and the cycle finishes with the effusion of viscous lava from the crater rim. Frazzetta et al. (1983) decided that this sequence was due to a steady decrease in the efficiency of water/magma interaction, becoming less explosive throughout the cycle (De Fino et al. 1991). Effectively early in the cycle water (propellant) dominates the eruptive style (explosive) and late in the cycle magma dominates the eruptive style (effusive).

Frazzetta et al. (1983) drew the following inferences from field relationships:

1. the volcanic activity took place over a relatively short period of time within each eruptive cycle;
2. the age of the lava flows could be assumed to be the age of the eruptive cycle; and
3. The interval between the ages of two subsequent lava flows is roughly equal to the period of quiescence between the end of one cycle and the start of the next (De Fino et al. 1991).

Frazzetta et al. (1983) studied the Commenda and Pietre Cotte cycles the two most recent cycles where magma mixing has occurred. They found that the four different stages within the cycle fitted well with their eruptive model. They hypothesised that various triggers were needed for the eruptions to begin and that a trigger could be due to the variability of the water/magma interaction or that a fresh batch of mafic magma could enter the magma chamber and cause an episode of magma mixing.

From their model, Frazzetta et al (1983) found that the 1888-1890 AD deposits which lie on top of the Pietre Cotte lava flow are not actually the start of a new cycle but that they are formed from the same pulse of magma that formed the lava flow. This magma pulse is also thought to be responsible for the Vulcanian type explosions which occurred between the Pietre Cotte lava flow and the 1888-90 AD eruption (De Fino et al. 1991). Within the 1888-90 deposits, regular and continuous chemical zoning has been found. The first products are rhyolitic phreatomagmatic breccias with enclaves of latite magma, followed by trachytic and latitic tephras (Clocchiatti et al. 1994).

Throughout the eruptive history of the volcano, the average length of the quiescent stage is about 400 years, although it may be getting shorter (De Fino et al. 1991). The earliest dating shows a quiescent stage of about 800 years and the most recent is only 300 years. Since 1890, the volcano has been in the current quiet period (De Fino et al. 1991).

However, recent work by Di Traglia, (2011) concluded that contrary to previously published work, the eruptive history of La Fossa occurred mainly in two eruptive phases. His remapping of the last 1000 years of eruptive products from the La Fossa vent concluded that the Palizzi and Commenda eruptions occurred as an eruptive cluster lasting for approximately 100 years during the 13$^{th}$ century whilst the eruptive cluster known as the Cratere Eruptive Cluster (the Pietre Cotte Cycle up to the most recent eruption in 1888-90) lasted 446 years (Di Traglia, 2011). Also, contrary to previously published work, Di Traglia (2011) found that the three trachytic lava flows (the Punte Nere, the Campo Sportivo and the Palizzi) occurred simultaneously at the end of the Palizzi eruption rather than at the end of each of the previously identified cycles.

Volcanic rocks from Vulcano can generally be split into two broad groups: older HKCA-SHO and younger SHO-KS products, following a similar pattern as to that seen over all the Aeolian Islands. De Astis et al (2000) found that the transition between these two groups occurred about 30Ka. They concluded that this transition was not because of evolutionary processes but actually due to the melting of two separate sources and this is probably caused by a change to the thermal structure of the upper mantle beneath the islands.

Generally the younger deposits of Vulcano are porphyritic and contain phenocrysts of plagioclase, Ca-rich clinopyroxene and olivine. The effusive products (lava) have reasonably high phenocryst contents (about 5% to more than 60% of the total rock volume), but the explosive deposits (scoria and tephra) have subaphyric textures with a much lower phenocryst content (typically 5 – 25%) (De Astis et al. 2000), showing that fractional crystallisation was occurring throughout the cycles.

Most authors agree that the formation of the more evolved rhyolites found on Vulcano are a result of both assimilation of the crust and fractional crystallisation (AFC) processes (Ellam et al. 1988, Del Moro et al. 1998, De Astis et al. 2000 and Gioncada et al. 2003). The eruptive cycles found on La Fossa are thought to possibly be due to mafic magma rising into the shallow (<3 km deep) reservoir(s) and then being differentiated by AFC processes (Del Moro et al.1998). It is these processes that are responsible for the variations in geochemical composition. When more mafic magmas rise into the shallow reservoirs they mix and evidence of this mixing between the more and less evolved magmas can be found in recent deposits (Del Moro et al. 1998). The presence of xenocrysts of olivine, plagioclase and augite, as well as other xenoliths of old lava fragments (De Fino et al. 1991), in both the Commenda and Pietre Cotte lava flows has also been used as evidence of magma mixing. The breadcrust bombs from the 1888-90 AD eruption also show trachytic and rhyolitic magma mixing (Frazzetta et al, 1983).

The Vulcanello peninsula is characterised by three scoria cones situated on a flat lava platform. Stratigraphic evidence suggests that the eastern pyroclastic cone (Vulcanello I) formed first, followed by the middle scoria cone (Vulcanello II) (Davi et al. 2009a). The exact time that the lava platform formed is slightly uncertain, Keller (1980) and Arrighi et al (2006) both suggest that the lava platform formed after Vulcanello II, however, De Astis et al (2006) show on their geological map of Vulcano that it formed slightly earlier, between the eruptions of Vulcanello I and II. The final stage of activity occurred in about 1650 AD and formed the third pyroclastic cone (Vulcanello III) and the Roveto lava flow (Davi et al, 2009a).

The activity on Vulcanello produced lava and scoria with a mafic to intermediate composition. Previous work carried out by Davi et al (2009a) found that major and trace element whole rock data indicated that the entire eruptive history of Vulcanello was due to the uninterrupted eruption of a single deep batch of magma. The products had a shoshonitic or latitic composition with abundant clinopyroxene phenocrysts. Other phenocrysts found were plagioclase, alkali feldspar, olivine and leucite but only in the shoshonites (Davi et al. 2009a).

### 2.2.3 Lipari

Lipari, just to the north of Vulcano, is the largest island in the Aeolian Island arc and has a maximum height of about 600m above sea level. The subaerial part of the volcano has an area of about 38 $km^2$. Crisci et al., (1991a) interpreted the volcanic activity of Lipari in terms of ten cycles, defined by prolonged discontinuities in activity, stratigraphical unconformities and abrupt compositional changes. The youngest volcanic products that were erupted from three vents in the north eastern part of the island show a similar northward progression of active centres to that of Vulcano. The last eruption (cycle X) produced both effusive and explosive products - firstly, a lava flow as well as pyroclastic deposits from the Forgia Vecchia centre, then the Monte Pilato pumice cone before ending with the Rocche Rosse obsidian lava flow. The Monte Pilato pumice cone has a diameter of about 1000m at its crater and a maximum thickness of tephra deposits of 150 m (Davi et al. 2009a).

The last eruption on Lipari occurred about 1400 years B.P (Crisci, 1991, Dellino & Volpe 1995). However, Gioncada et al, (2003) note that historical reports for the last stage of volcanic activity on the island occurred roughly 1221 BP. Further research has increased the uncertainty of the age of the eruption with an age of 720 ±40 BP (Arrighi et al. 2006, Davì et al. 2009b). It is now thought that there were two stages to the cycle X eruption, the older one from ~1220 BP and the younger one from 720BP (Davì et al. 2009b). One line of thinking is that the Monte Pilato deposits actually represent two distinct phases of the Cycle X eruption and this is why there is a range in the ages (Rosi. pers comm. 2008). Presently low-temperature fumaroles together with hot springs are the only signs of volcanic activity (Cortese et al. 1986).

The tephra from the initial explosive activity of Cycle X eruption is very important as a tephra stratigraphic marker on nearby Vulcano and Vulcanello (Cortese et al. 1986). The tephra clasts (few centimetres to 15 cm) from the Monte Pilato cone are made up of highly vesicular, glassy clasts (pumice) in an ash matrix, with a rhyolitic composition (Cortese et al. 1986). There are also occasional lithic clasts. Gioncada et al. (2003) proposed a geochemical model where the recent rhyolites from Lipari were produced by fractional crystallisation of andesitic to latitic magmas along with a small amount of crustal assimilation.

### 2.2.4 Similarities between Vulcano and Lipari

Favalli et al. (2005) carried out a high-resolution Digital Elevation Model (DEM) to investigate the geomorphology and tectonics of the Aeolian Islands. The model showed many fine details of landforms from the submarine parts of both Vulcano and Lipari. From the DEM, (Figure 2.5) it is possible to see that the north-eastern sector of the Vulcanello platform is sharply cut in NW-SE direction by a fault. To the northwest of the Vulcano the hummocky surfaces seen could be the remnants of a sector collapse (probably from the Lentia complex). The volcanic islands are generally characterised by composite structures with deposits from both effusive (lava flows and domes) and explosive (pyroclastic) activity (Favalli et al. 2005).

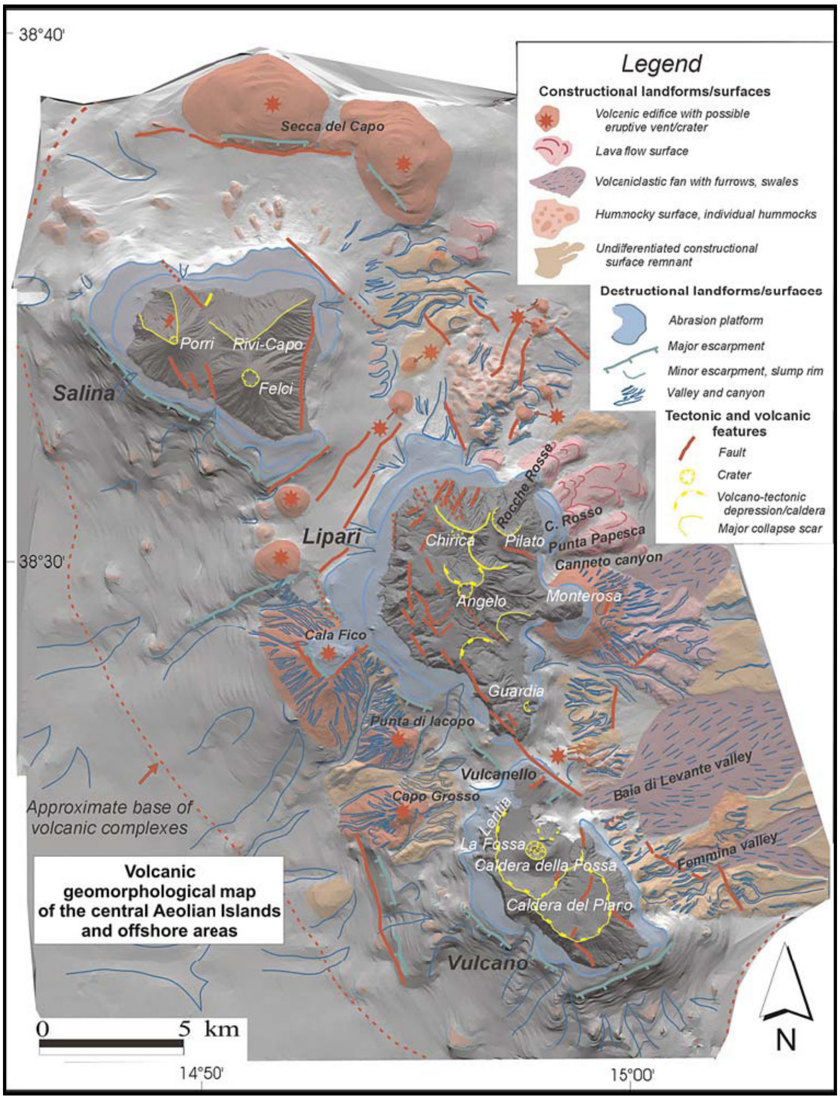


Figure 2.5: The DEM showing the geomorphological and structural detail of Vulcano, Lipari and Salina using a shaded relief image (Favalli et al. 2005).

De Rosa et al (2003) also believe that the islands of Salina, Lipari and Vulcano can be grouped together as a single volcanic system as they are all associated with the Tindari - Letojanni fault. The oldest rocks of this system generally have a more mafic and intermediate composition with the younger deposits being more felsic and evolved. Interestingly all three islands have volcanic rocks with mixed mafic and felsic melts (De Rosa et al. 2003) perhaps indicative of there being multiple distinct shallow magma storage chambers beneath each volcano. The more evolved rhyolites from Vulcano and Lipari are almost indistinguishable from each other on the basis of major element data (Gioncada et al. 2003). However, trace element data show that overall the LREE are more enriched in the Vulcano (La Fossa) volcanic deposits compared to those from Lipari (Gioncada et al. 2003). The differing trace element variations are correlated with time which indicates that fractional crystallisation is responsible for the variations.

## 2.3 Magma Differentiation and Crystallisation

### 2.3.1 Magma Mixing

Throughout the history of La Fossa, until the Palizzi cycle, the eruptive products from the volcano were relatively homogeneous trachytes. However, since the Palizzi cycle and up to the last eruption (1888-90 AD), a range of products have been erupted and the most recent products have been dominated by rhyolites (De Fino et al. 1991).

De Fino et al (1991) studied lavas and volcanic bombs from the stratigraphic sequence between the Palizzi lava flow and the 1888-90 deposits in great detail in order to try to define how magma processes (e.g. mixing, fractionation) have affected the recent eruptive history of La Fossa cone on Vulcano. The breadcrust bombs that were erupted during the 1888-90 AD eruption have textural and chemical features indicative of mixing between trachytic and rhyolitic end-members. Clocchiatti et al (1994) found that there were actually three main types of magma involved in the eruption (latite, trachyte and rhyolite) and suggested that the trachytes were hybrids formed from the mixing of latite and rhyolite magmas. Reaction rims of orthopyroxene around olivine and K-feldspar phenocrysts as well as textural features such as banding provided abundant evidence of magma mixing (Clocchiatti et al, 1994). Assimilation of wall-rock was deduced by the presence of partially melted metamorphic xenoliths (Guest et al, 2003).

Following the Palizzi cycle, it has been suggested that there were some complex changes within the volcano which would account for the recent evidence of magma mixing on La Fossa. For example, the rhyolitic Commenda lava flows contain plagioclase, augite and olivine xenocrystals as well as trachytic lava fragments which have similar compositions to older lava fragments and crystals, showing they were entrained whilst ascending from the magma chamber (De Fino et al. 1991) The 1888-90 AD breadcrust bombs show evidence of trachytic and rhyolitic mixing which must have occurred rapidly during eruption, as purely trachytic bombs were also erupted at the same time (De Fino et al. 1991). Zanon et al, (2003) used $CO_2$ fluid inclusions to show mixing and the existence of two magma storage chambers (i.e., upper crust and lower crust near the Moho).

Magma mixing and mingling was also found in volcanic rocks from Lipari (Davi et al. 2009b) and Salina (Calanchi et al. 1993). These authors suggested that mixing of mafic and felsic magma in shallow reservoirs often played an important role in influencing the eruptive dynamics and in triggering an explosive eruption.

### 2.3.2 Zoning in Phenocrysts

In volcanic systems, the composition of a crystal can record changes in magma composition, pressure, temperature and volatile content within a magma system (Davidson et al. 2007). As such they can monitor those variables in time and space. Traditionally most studies of magmatic systems using crystal zoning have been carried out on plagioclase crystals as the optical properties of the mineral can infer the chemical variations occurring within it (Ginibre et al. 2007). However, with recent advances, it is now possible to conduct high resolution geochemical investigations of zoned feldspars, pyroxenes and olivines using electron microprobe analysis (EMPA) and laser ablation (LA-ICPMS) (e.g., Baker et al 2000, Davidson et al. 2007).

Homma (1932, in Ginibre et al. 2007) first suggested that zoning in plagioclase could be due to convection within a magma chamber. Since that time numerous studies have been carried out on phenocrysts to determine the processes operating within magma chambers during crystallisation (Ginibre et al. 2007, Orejana et al. 2007 and references therein).

There are three main types of zoning found in igneous phenocrysts:

- **Normal zoning:** in the case of plagioclase this is a change from high temperature, Ca-rich composition in the core of the crystal to a lower temperature, Na-rich composition at the rim, similar to the cooling and chemical differentiation processes the host magma is undergoing.
- **Reverse zoning:** in the case of plagioclase, the core is more Na-rich and the rim has a more Ca-rich composition. This indicates that disequilibrium is occurring and the host magma has returned to being less evolved, possibly due to an input of fresh more mafic magma into the chamber.
- **Oscillatory zoning:** this is a repetitive, periodic variation of the crystal composition resulting in generally concentric growth zones. It can be caused by repeated inputs of fresh, less evolved magma into a more evolved chamber (Ginibre et al. 2007).

Chemical zoning in phenocrysts can also help to discriminate between different hypotheses about the magma in which they formed. Zoning can be a result of changes in mineral melt equilibria during phenocryst crystallisation, due to the chemistry of the crystal, or to do with exactly how the crystal grew (Orejana et al. 2007). Figure 2.6 illustrates how chemical zoning can arise due to various processes involving replenishment of contaminated magma systems, primitive magma recharge, crustal contamination, and phenocryst transfer through single or multiple magma systems (Davidson et al. 2007).

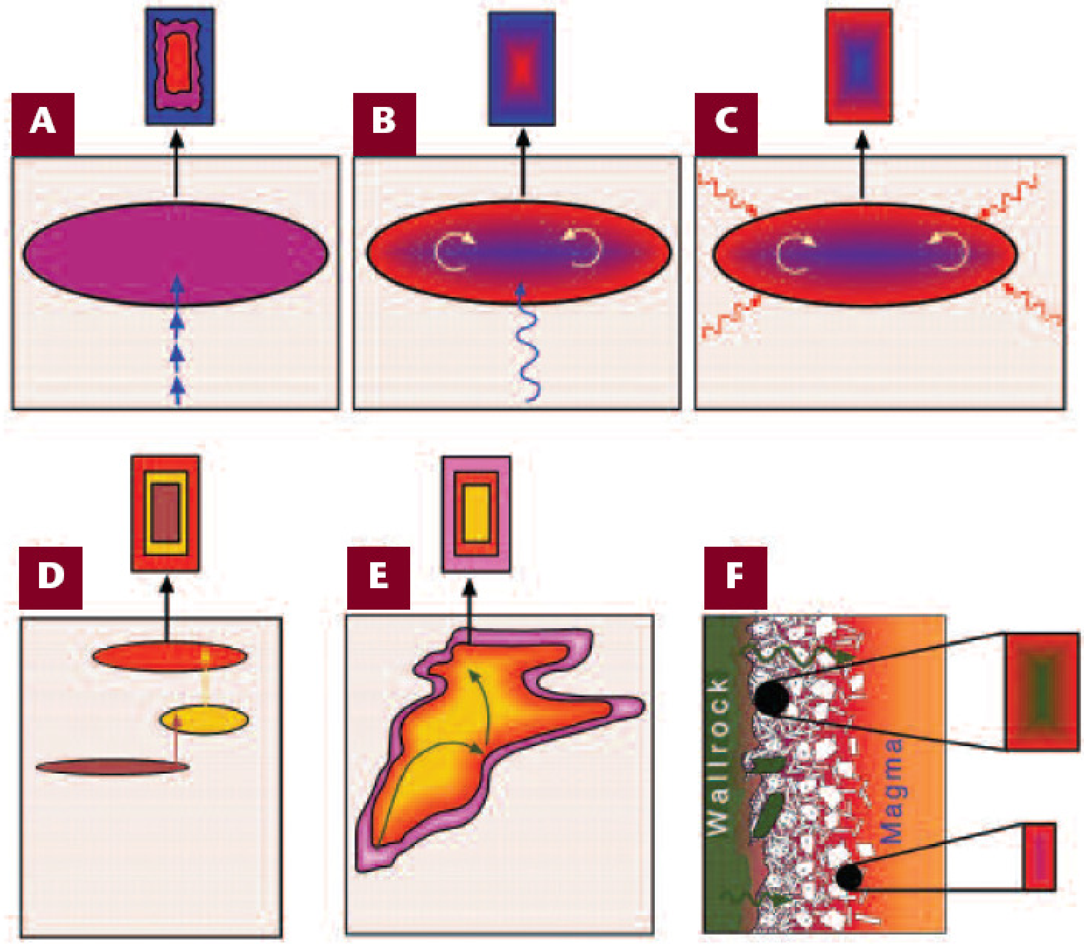


Figure 2.6: Schematic diagram showing how variations in the magmatic evolution process may be reflected in single crystals. (A) contaminated magma in the crust modified by multiple pulses of more primitive magma forms oscillatory zoned crystals with chemically discrete rims. (B) reverse continuously zoned crystal due to gradual primitive magma recharge. (C) normal continuously zoned crystal due to gradual mixing of a crustal contaminant so the opposite of B. (D) oscillatory zoned crystal due to transfer between discrete magma storage systems of differing composition. (E) oscillatory zoned crystal transferred within a single, zoned magma chamber. (F) crystals produced at the edge of a magma system will show a differing composition to those isolated from the wall rock. The larger crystal is older than the smaller one. (Davidson et al. 2007)

Zoned plagioclases from Montserrat (Stewart & Fowler, 2001) were used to provide new insights into the character of the eruption mechanism. They found that it was possible to conclude that there had been several distinct periods of growth during the evolution of the magma and that oscillatory growth of the crystals could be due to the repeated intrusion of hotter, more mafic magma corresponding with the cycles of dome inflation, eruption and explosive activity (Stewart & Fowler, 2001).

Davi et al (2009a) studied zoned phenocrysts on Vulcanello and found that complex zoning existed in clinopyroxenes from all deposits sampled. They also found that several feldspars from shoshonites and latites showed reverse zoning which was interpreted as a result of an increase in temperature and change in composition of the magma during crystallisation. As there is no evidence of mixing or mingling in the products from Vulcanello, it is thought that reverse or oscillatory zoning could be due to an overturn of the magma chamber and/or a fresh input of more mafic magma (Davi et al. 2009a).

### 2.3.3 Melt Inclusions

Complex volcano feeding systems can be better understood by studying melt inclusions found in phenocrysts. These inclusions can provide information on the major and trace element and volatile composition of the pre-eruptive and syn-eruptive magmas. Melt inclusions have also been used to infer the crystallisation temperatures of the phenocrysts and the eruptive products (Gioncada et al. 1998).

The usefulness of phenocryst melt inclusions to obtain information about pre-eruptive conditions in silicate melts has been demonstrated by many workers (e.g. Metrich & Clocchiatti 1989; Dunbar & Herveg 1992; Marianelli et al. 1995; Metrich et al. 1993; Gioncada et al. 1998). Melt inclusions are generally abundant in clinopyroxene and plagioclase phenocrysts, reasonably common in olivines but rarely found in potassium feldspars (Gioncada et al. 1998). The petrogenetic evolution of magma systems can be studied by integrating melt inclusion data from “early-forming” high temperature crystals like olivine which can constrain pre-eruptive magma chemistries, to “later-forming” lower temperature minerals like plagioclase, which can constrain syn-eruptive conditions.

For Vulcano, the study of melt inclusions is particularly important as it complements the bulk rock data and provides us with more detail about the pre-eruptive history. Some issues that arise with bulk rock data include:

1) Mixing and mingling is often found in the erupted products which means that the bulk rock data will obscure the detail and produce ‘average’, and hence, meaningless compositions.
2) Pyroclasts contain a mixture of glass and phenocrysts and perhaps even lithic fragments. This means that bulk rock analyses based on crystal rich pyroclasts will be very different from the true magma composition.

3) Erupted products may preferentially sample the magmas present in the magma chamber but not necessarily all the components involved in petrogenesis. For example mafic basaltic 'triggers' may remain in the magma system, or be hybridised and only be discovered through analysis of melt inclusions in olivines.
4) Most importantly, melt inclusions provide information about pre- and syn-eruptive volatiles which may well be lost from the bulk rock products during the eruption process.

Gioncada et al (1998) studied melt inclusions from Vulcano in order to deduce the composition of primitive melts trapped in phenocrysts and identify how these liquids evolved. They also examined the pre-eruptive volatile content of magmas so that the Vulcano magmatic feeding system could be better understood. Samples from the last 50,000 years of eruptive history on Vulcano were analysed, to encompass the entire range of magma compositions (Gioncada et al. 1998). Throughout this time interval significant geochemical variations occurred as well as changes to the location of the eruptive centres which was caused by extensional activity (Ventura 1994).

Gioncada et al (1998) selected clinopyroxenes and olivines in pyroclastic samples because explosive eruptive deposits were most likely to contain glass inclusions due to the rapid syn-eruptive cooling. In addition there is likely to be minimal modification by post-entrapment crystallisation, compared with melt inclusions from slow cooling, effusive products (Gioncada et al. 1998). Both the clinopyroxene and olivine inclusions show a range of morphologies with the majority being rounded although others showing a similar shape to that of the host crystal. The inclusions range in size from a few microns to 150 µm, generally along the planes of growth within the host crystals (Gioncada et al. 1998). Despite choosing rapidly cooled crystals, Gioncada et al (1998) still found various degrees of post-entrapment crystallisation in the glassy melt inclusions. They also observed that more post-entrapment crystallisation was found in melt inclusions from hybrid products compared to those from the more primitive host minerals.

Gioncada et al (1998) demonstrated that melt inclusions found within the fosterite-rich olivines from La Sommata (50 ka) and the 1888-90 eruptions contained high $CaO/Al_2O_3$ mafic 'basaltic' melts unique to the Aeolian Islands. They also found that the melt inclusions from the two different deposits had a similar pattern of trace element abundances and similar, high volatile contents, as well as having formed at a similar temperature (Gioncada et al. 1998).

## 2.4 Conclusions

- Recent research has shown that the magma plumbing system below the La Fossa vent on Vulcano, Italy comprises two magma systems: a shallow, evolved, felsic component and a deeper, less evolved, mafic component (Gioncada et al. 2003, Peccerillo et al. 2006).
- Mafic - felsic magma mixing and mingling is reported in erupted products that are younger than the Palizzi cycle. Similar deposits have been found on both Lipari and Salina, and it is thought that mafic - felsic magma mixing can trigger explosive eruptions.
- Zoned phenocrysts are very important as they act as “time capsules” for temporal and spatial changes in pressure, temperature and volatile content within the magma chamber. Three main types of zoning indicating different conditions can be found: normal, reverse and oscillatory.

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# Chapter 3: Chronostratigraphy

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## 3.1 Introduction

The aim of this chapter is to review chronological data from Vulcano and to present new $^{14}C$ data from the Commenda stratigraphic unit. Chronostratigraphy is the important first step in refining the timeframe of the effusive and explosive deposits, prior to understanding the magma evolution beneath the volcano. To date, most geochemical studies have investigated temporal changes in petrology and chemistry at Vulcano over timescales of 100 ka or 1 Ma years (De Astis et al, 2000, Gioncada et al, 2003). This project focuses on the recent eruptive history (≤2ka) and the significance of the small scale cyclicity within that timeframe. Accurate dating of the volcanic deposits is crucial in order to evaluate the overall chronostratigraphy of the volcanic deposits, as well as the frequency of the eruptive cycles on La Fossa and the eruptions of Vulcanello. Also, accurate dating, combined with detailed stratigraphy, is vital in order to be able to understand the synchronicity of eruptions on La Fossa and Vulcanello.

A comprehensive review of previously published dates (Table 3.1) associated with the various eruptive cycles at La Fossa and Vulcanello has been completed (Arrighi et al, 2006; Voltaggio et al; 1995; Frazzetta et al; 1983, Frazzetta et al; 1984 & Keller, 1970 and references therein). It is immediately apparent that accurate dating of the volcanic deposits is difficult, as many of the traditionally accepted dating methods (i.e., K/Ar, $^{40}Ar/^{39}Ar$) are not suitable for such young rocks (≤6ka). However others methodologies (i.e., $^{14}C$, Ra/Th) can provide useful chronological constraints and the most suitable dating method for deposits younger than 6000 years is $^{14}C$ dating. This is reliant on suitable carbonised material being found within the deposits which meant that during fieldwork on Vulcano, charcoal was specifically looked for. Charcoal was found in seven trenches (for further detail of the charcoal collection fieldwork, see Appendix A). In this study, $^{14}C$ dating of charcoal was undertaken to try to resolve conflicting ages and to provide dates for specific eruptions or deposits that have so far remained been undated.

Whilst the most recent eruptive episode occurred between 1888 and 1890 AD, and the eruptions are very well documented (Mercalli and Silvestri 1891, Johnson-Lavis et al 1891) there is considerable uncertainty about the ages of the older deposits (Frazzetta et al, 1984). In addition, there is some uncertainty about the exact relationship between La Fossa and Vulcanello as well as the eruptive age of Vulcanello (Arrighi et al, 2006). Although recent archaeomagnetism (Arrighi et al, 2006; Tanguy et al, 2003) dated Vulcanello at nearly 1000 years younger than the previously accepted dates, there is slight controversy about this methodology (Lanza et al, 2005a,b; Tanguy et al, 2005) Lanza et al use a thermal remanent magnetisation direction that has a small angle difference to corresponding historical direction. The age of the Monte Pilato eruption of Lipari will also be reviewed as this eruption formed a prominent white ash layer on both La Fossa and Vulcanello and is subsequently used as a stratigraphic marker. By compiling all the previously published dates, reviewing the different methodologies and comparing them to a stratigraphic log, the chronostratigraphic logic of the dates will be evaluated.

Table 3.1: Compilation of the published ages for the La Fossa and Vulcanello deposits

| Unit Name | Age (BP) | +/- | Method | Paper - Author |
|---|---|---|---|---|
| **La Fossa:** | | | | |
| 1888-90 | 61 | 1 | historical records | Johnson-Lavis et al; 1891 |
| Pietre Cotte lava flow | 211 | | historical records | Keller; 1970 |
| Pietre Cotte lava flow | 215 | 4 | historical records | Frazzetta et al; 1983 |
| Pietre Cotte lava flow | 230 | 30 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Commenda lava flow | 700 | 100 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Commenda lava flow | 1165 | | historical records | Arrighi et al; 2006 |
| Palizzi lava flow | 720 | 20 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Palizzi lava flow | 1500 | 200 | Ra/Th dating | Voltaggio et al; 1995 |
| Palizzi lava flow | 1550 | 1000 | K/Ar dating | Frazzetta et al; 1984 |
| Palizzi pyroclastic deposits | 2100 | 300 | Ra/Th dating | Voltaggio et al; 1995 |
| Palizzi pyroclastic deposits/pumice | 2200 | 1300 | K/Ar dating | Frazzetta et al; 1984 |
| Unidentified shoshonitic lava | 2900 | 400 | Ra/Th dating | Voltaggio et al; 1995 |
| Campo Sportivo lava flow | 4600 | 1950 | K/Ar dating | Frazzetta et al, 1984 |
| Punte Nere lava flow | 780 | 20 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Punte Nere lava flow | 5500 | 1300 | K/Ar dating | Frazzetta et al; 1984 |
| **Vulcanello:** | | | | |
| Vulcanello III | 325* | 100 | $^{14}C$ - organic matter | Keller, 1970 |
| Vulcanello II | 720 | 30 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Vulcanello II | 770 | 70 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Vulcanello II | 2041 | | historical records | Arrighi et al; 2006 |
| Vulcanello platform | 770 | 30 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Vulcanello lava flow | 1900 | 200 | Ra/Th dating | Voltaggio et al; 1995 |
| Vulcanello platform | 850 | 60 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Vulcanello platform | 2105 | 28 | historical records | Arrighi et al; 2006 |
| Vulcanello I | 870 | 50 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Vulcanello I | 900 | 70 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Vulcanello I | 950 | 60 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Vulcanello I | 2105 | 28 | Historical records | Keller; 1970 |
| **Lipari:** | | | | |
| Lipari (Rocche Rosse lava flow) | 720 | 40 | Archaeomagnetic dating | Arrighi et al; 2006 |
| Lipari (Rocche Rosse lava flow) | 730 | 30 | Archaeomagnetic dating | Tanguy et al; 2003 |
| Lipari | 1174 | +110/-90 | $^{14}C$ - carbonised wood | Keller; 2002 |
| M. Pilato, Lipari | 1201 | | Historical records | DiRoberto et al; 2008 |
| M. Pilato, Lipari | 1221 | | Historical records from St. Willibald (monk) | Frazzetta et al; 1984 |
| M. Pilato, Lipari | 1250 | | Archaeological evidence | Voltaggio et al; 1995 |
| M. Pilato, Lipari | 1370 | | Historical records | Cortese et al; 1986 |

* date given in C-14 years BP

## 3.2 Dating of Vulcano

The five main methods that have been used to assign ages to the various deposits of La Fossa and Vulcanello, and the Monte Pilato eruption from Lipari are shown in Table 3.1. The following is a brief review of these different methods and an indication of how reliable they are for the La Fossa and Vulcanello deposits. This will be followed by a review of $^{14}C$ dating and presentation of new data from La Fossa and Vulcanello

### 3.2.1 Historical Records

For Italian volcanoes, historical records can be very useful in determining the dates of eruptions since the Roman era (e.g. Pliny the Younger's description of the 79 AD eruption of Vesuvius). Generally the interpretation of historical accounts should be cautiously considered as there is much room for error as the observers may not have had a full understanding of what they were observing. Indeed historical accounts do not provide any actual evidence that what the authors saw occurring at the time, is evident in the rocks today (Arrighi et al, 2006). Also, due to the fact that the only suitable port was directly below the active vent, Vulcano was uninhabited for most of the medieval times which means there are large gaps in the historical record for the island (Tanguy et al. 2009). Although historical records may be unreliable for the precise date, they can be useful as they may probably provide information on the duration of events in a general sense.

The most recent eruption from La Fossa occurred between 1888 and 1890 AD and several detailed eye-witness accounts and photographs, taken from both Vulcano and the neighbouring island of Lipari, recorded the event (Johnston-Lavis et al, 1891). These historical records detail the different stages of the 20 month-long eruption, culminating in the paroxysmal explosive event on 15 March 1890 (Johnston-Lavis et al, 1891). These different eye-witness accounts can be confirmed by the study of the explosive deposits on La Fossa (Guest et al, 2003). The Pietre Cotte eruption and effusive activity was reported by several observers. The work of Mercalli & Silvestri (1891) and De Fiore (1922) summarised in both Keller (1970) and Frazzetta et al (1983) reported a visit by 'Le Duc' who saw a lava flow that had recently occurred on the north western flank of La Fossa in 1757. According to De Fiore, the lava flow that 'Le Duc' saw is the Pietre Cotte flow which was extruded at the end of the 1731 to 1739 active period. There is some discrepancy because the work of Mercalli and Silvestri (1891) summarised by Frazzetta et al (1983) suggest that La Fossa was erupted during 1771.

The Commenda lava flow was dated as having erupted in 785 AD (Arrighi et al, 2006; Frazzetta & La Volpe, 1991) by referring to work done by Frazzetta et al (1984) but there is no mention of this date in that particular paper and in fact no earlier records can be found to confirm the date.

Several historical records referring to the formation of Vulcanello by Strabo and Plinius were originally reviewed by De Fiore (Frazzetta et al, 1983; Arrighi et al, 2006 and references therein). The dates given by Plinius and Strabo of 183 - 126 BC for the formation of Vulcanello were accepted and widely cited until archaeomagnetic dating carried out by Arrighi et al (2006). Arrighi et al (2006) argue that whilst there may have been an eruption forming a small island during the time of Plinius and Strabo, that island was subsequently destroyed and another island formed in the same place more than a thousand years later (Arrighi et al, 2006). This recent work means that in the case of Vulcanello, the dates produced from historical writings are generally no longer accepted.

The Monte Pilato eruption of Lipari forms a distinct and prominent marker horizon both on La Fossa and Vulcanello, and this tephra layer has been described in detail (Keller, 1970). It appears from the literature that there may have been several different eruptions from Monte Pilato over a 500 year time period. As well as historical records, another method used to assign an age to the Monte Pilato deposit from Lipari was from archaeological excavations of the old town of Contrada Diana on Lipari (Bescoby et al, 2008). The age produced through this method agrees with the historical records and radiocarbon dating for M. Pilato. The data indicates that there was volcanic activity on Mount Pilato at the Forgia Vecchia crater sometime during the 6$^{th}$ Century. This age is based on the fact that the ash layer covers the ruins of a town and burial site which is believed to have been built in the 4$^{th}$ and 5$^{th}$ centuries. The ash layer is clearly obvious in the 'Parco Archeologico Contrada Diana' which contains sections of the Greek walls, the Roman town and the necropolis' tombstones (Bescoby et al, 2008).

For the purposes of this research, the historical records of the 1888-90 La Fossa eruption (Johnson-Lavis et al, 1891) and the 215 BP Pietre Cotte lava flow (Frazzetta et al, 1983) will be used in the chronostratigraphic assessment of the recent eruptions at La Fossa and Vulcanello.

### 3.2.2 Archaeomagnetic Dating

Archaeomagnetic dating, similar to palaeomagnetic dating relies on two key facts:

i) magnetic minerals cool below the Curie point and record the direction and intensity of the geomagnetic field

ii) the geomagnetic field changes direction over time due to secular variation (Tanguy et al. 2009).

Age determination is based upon directional geomagnetic variation reconstructed from historically dated lavas in Southern Italy, and from archaeological sites in Western Europe (Arrighi et al. 2006). The samples from Vulcano were compared with the volcanoes of southern Italy which have had their DEMF (i.e., Direction of the Earth's Magnetic Field) identified for the last 2000 years by using lavas from Etna, Vesuvius and Ischia (Tanguy et al. 2003).

Arrighi et al (2006) carried out an extensive program of dating different lava flows from both La Fossa and Vulcanello, using 185 samples from 15 different sites. A large number of these samples were later discarded as only lavas erupted at a high temperature and subsequently undisturbed, can be analysed. Archaeomagnetic dates are shown in Table 3.1 for the Pietre Cotte, the Commenda and the Palizzi from La Fossa, Vulcanello II, the Vulcanello platform and Vulcanello I from Vulcanello and also the Rocche Rosse from Lipari deposits

The Commenda lava flow (1250 ± 100 years AD) has a very poorly constrained magnetic direction which means that it is statistically indistinguishable from the Palizzi lava flow (Arrighi et al, 2006). According to the composite columnar log of La Fossa produced by Frazzetta et al (1983) this is unlikely as the two lava flows are stratigraphically separated by the Commenda breccia, the Monte Pilato marker bed and the Commenda Ash surge beds. Another concern is the Punte Nere lava flow which has an age of 1170 ± 20 years AD, which is younger than that expected from the stratigraphic log produced by Frazzetta et al (1983). As such it is 'anomalous' on Figure 3.1. Arrighi et al, (2006) acknowledge that this date may be incorrect as it is similar to the Palizzi lava flow.

The geomagnetic field used to calibrate the archaeomagnetic results becomes increasingly ambiguous because older geomagnetic directions can overlap with younger geomagnetic directions (Arrighi et al, 2006). Arrighi et al (2006) note that the Punte Nere lava flow has a significantly different geomagnetic direction (for a 95% confidence level), to any other known direction for the last 5000 years. This means that the Punte Nere lava flow could theoretically be assigned an age older than 5000 years which is consistent with its stratigraphic position.

Recent work by Roverato et al (2008) and Di Traglia (pers. comm. 2010) has revealed that the Punte Nere lava flow is not part of an older cycle. They suggest that it occurred contemporaneously with the Palizzi and the Campo Sportivo lava flows. These three lava flows were erupted in different directions - Palizzi to the south, Campo Sportivo to the north – west, and Punte Nere to the north - east. It has previously always been assumed that the Commenda lava flow formed at the end of the Commenda cycle, but recent work shows that it formed at the beginning of the cycle immediately after the Palizzi lava flow (Di Traglia pers. comm. 2010). This is consistent with archaeomagnetic dating (Arrighi et al 2006, Di Traglia, pers comm. 2010).

The dates produced by archaeomagnetic dating for all of the Vulcanello peninsular conflict with previously published (Historical and Ra-Th dating) data, although they define a similar chronostratigraphic order. The archaeomagnetic dates range from 1000 ± 60 years AD (Vulcanello I) to 1230 ± 30 (upper Vulcanello platform) making it almost 1000 years younger than had been previously thought (Arrighi et al, 2006). A fine layer of white ash which occurs above the Vulcanello II is believed to be from the rhyolitic eruption of Monte Pilato, Lipari which traditionally has been assigned an age of *ca.* 800 years AD., which means that this does not match with the refined stratigraphic age. Organic matter from a paleosol beneath the oldest Monte Pilato deposits produced the age of 800 years AD. Arrighi et al, (2006) explain the discrepancy in age by arguing that on the island of Lipari, the youngest eruption of Monte Pilato, the Rocche Rosse tephra and lava flow, was the final phase of the Monte Pilato eruption. Tanguy et al (2003) analysed the final phase of the Monte Pilato eruption, the Rocche Rosse lava, and reported an age of 1220 ± 30 years AD which matches the archaeomagnetic ages produced for Vulcano (Arrighi et al 2006).

For the purposes of this research, the archaeomagnetic dating of the Pietre Cotte lava flow, Commenda lava flow, Palizzi lava flow, Punte Nere lava flow, Vulcanello Lava Platform and Rocche Rosse (Lipari) lava flow, as well as the explosive deposits of Vulcanello II, and, Vulcanello I (Arrighi et al, 2006; Tanguy et al, 2003) will be used in the chronostratigraphic assessment of the recent eruptions at La Fossa and Vulcanello.

### 3.2.3 Ra-Th Dating

Voltaggio et al (1995) proposed a new leaching method for dating young (< 8ka) potassic rocks by using a method based on $^{226}Ra/^{230}Th$ radioactive disequilibrium. This method relies on using Ba, K or Rb as stable chemical analogues for radium. According to Voltaggio et al (1995), the resulting dates produced by this method have a precision of 200 - 400 years, which is considerably better than K-Ar dating.

Voltaggio et al, (1995) used their newly proposed method to date pyroclastic deposits of the Palizzi as well as the Palizzi trachytic lava flow and a shoshonitic lava flow which was thought to precede the Palizzi cycle from the La Fossa eruptive centre. They also dated the Vulcanello lava platform on Vulcanello. Their method produced ages which were reasonably precise and more accurate than the traditional K-Ar method with the younger dates (from Vulcanello and Palizzi) having an uncertainty of ±200 years and the oldest (the shoshonitic lava flow) an uncertainty of ±400 years. Voltaggio et al (1995) state that the leaching procedure that they use is best with shoshonitic rocks that have relatively high concentrations of U, Th and K. The method can be used successfully since the rocks from both La Fossa and Vulcanello are rich in potassium (K). Their procedure relies on the assumption that all the mineral phases forming the original rock have the same $^{230}Th/^{232}Th$ ratio.

Arrighi et al (2006) showed that this work is based on assumptions that there is no $^{226}Ra$ in the sample which means that if there was any initially present then the actual age of the deposit would be younger than the age assigned from this method. They also state that this method should therefore only be considered as yielding a possible 'maximum age' and the possibility that they are younger should be considered. This is the reason why there is a discrepancy between the ages produced through Ra-Th dating and the archaeomagnetic dating method (Arrighi et al, 2006).

For the purposes of this research, the ages produced through Ra-Th dating of the various lava flows will be considered as a guide to the maximum possible age of the deposits but will not be used in the chronostratigraphic assessment of the recent eruptions at La Fossa and Vulcanello.

### 3.2.4 K-Ar Dating

Potassium-argon (K-Ar) dating is a commonly used dating method for geochronology and archaeology. K-Ar relies on calculating the time it takes an isotope of potassium to turn into an isotope of argon. $^{40}K$ has a very long half ($1.248 \times 10^9$ years) which means that it is ideal for dating minerals and rocks that are older than 100,000 years and although it is possible to date deposits that are only several thousand years, the accuracy is very poor as not enough Ar has formed to be measured without leading to large errors (McDougall et al, 1977). Lavas that cool quickly are the best type for K-Ar dating as they also preserve the direction and intensity of the magnetic field locally, which meant that it was this method that was used to calibrate the geomagnetic polarity timescale (McDougall et al, 1977).

The ages derived from K-Ar dating for deposits from Vulcano were first mentioned in Frazzetta et al (1984). The deposits analysed were all from La Fossa: the Palizzi lava flow and a Palizzi pyroclastic flow, the Campo Sportivo lava flow and the Punte Nere lava flow. The uncertainty on these ages is very large between ± 1ka for the youngest (the Palizzi lava flow) and ± 1.4ka for the Punte Nere deposits, which is far too large to be a useful for this study. Arrighi et al (2006) state that despite the large uncertainty in the case of the K-Ar dated Palizzi lava flow, the age can be considered consistent with the age produced from the archaeomagnetic dating of the same deposit.

Looking at the ages calculated through K-Ar dating, the error on the age of the Palizzi Lava flow is 64.5%, the pyroclastic Palizzi deposits have an error of 59.1%. The Campo Sportivo lava flow and the Punte Nere lava flow also have large errors on their ages, 42.4% and 23.6 % respectively. This means that for the purposes of this research, none of the ages calculated through K-Ar dating will be used in the chronostratigraphic assessment of the recent eruptions at La Fossa and Vulcanello.

### 3.2.5 Radiocarbon Dating

Charcoal can generally only be formed when there has been enough of a hiatus in volcanic activity for plants to grow. It is also necessary that they are converted to charcoal either prior to, or synchronous with, the deposition of overlying deposits. Previously, there have only been two dates published from $^{14}C$ dating for the deposits relevant to research on Vulcano and Lipari.

Pyroclastic density currents (PDCs), both in the form of surges and flows are hot enough to preserve plant material as charcoal as a result of incomplete combustion. The subsequent rapid burial of any charcoal fragments means that they are preserved (Hudspith et al, 2010). Experimental work carried out on charred wood samples from the Taupo Ignimbrite, New Zealand, have found that the minimum charring temperatures ranged from 269 to 398 °C

(Hudspith et al 2010). In contrast, pyroclastic falls are invariably cooler than flow deposits (welded and unwelded) so any charcoal found in fall deposits is invariably entrained or re-worked.

The formation of the charcoal depends on several factors. Lockwood & Lipman (1980) studied charcoal which had been found beneath basaltic lava flows on Hawaii, and suggested that factors included the temperature of the flow, the duration of exposure of the plant, the amount of oxygen and the size, density and state (wet or dry) of the original piece of wood (Lockwood & Lipman, 1980).

Charcoal from Vulcanello III yielded the first radiocarbon date for Vulcano (Keller, 1970). The charcoal was found within the tuff (fall) of Vulcanello III where there is an erosional unconformity and gave an age of 325 ± 100 $^{14}C$ years BP. The date has a large uncertainty as it is very young so the analytical process leads to the relative large range in age (Bronk-Ramsey, pers comm. 2010). Keller (2002) also dated carbonised wood from a paleosol beneath the Monte Pilato pumices on Lipari which yielded a calibrated $^{14}C$ date for the soil of 776 (+110/-90) years AD (Arrighi et al, 2006, Tanguy et al, 2003).

## 3.3 $^{14}C$ Dating of Vulcanello

Details of sample locations for charcoal subsequently processed for $^{14}C$ dating can been found in Appendix A. The data for Vulcanello are presented in Table 3.2 and Figure 3.1 shows the calibration plots produced for the radiocarbon results for the charcoal from Vulcanello.

| OxA | Sample | Material/host | $\delta^{13}C$ | Uncalibrated Date | Calibrated Date |
|---|---|---|---|---|---|
| **Vulcanello, Italy** OxA-22581 (Hand-dug Pit 1) | CS1 | Charcoal/fall | -22.9 | 448 ± 25 | 506 ±26 |
| **Vulcanello, Italy** OxA-22582 (Trench 2) | CS3 | Charcoal /fall | -26.39 | 461 ± 26 | 514 ±22 |
| **Vulcanello, Italy** OxA-22105 (Trench 4) | CS4a | charcoal/fall | -23.41 | 1795 ± 27 | 1722 ±97 |
| **Vulcanello, Italy** OxA-22841 (Hand-dug Pit 2) | CS6 | charcoal/fall | -26.19 | 717 ± 22 | 671 ±19 |

Table 3.2: The results of the successful radiocarbon measurements from Oxford Radiocarbon Accelerator Unit

The uncalibrated dates were then entered into the 'Oxcal computer program (v4.0)' of C. Bronk Ramsey, using the `INTCAL09' dataset (Radiocarbon 51 (4), 2009) and these produced the calibration plots shown in Figure 3.1. The plots show how the uncalibrated date, which is also known as the radiocarbon determination (in BP), can be converted into a calibrated date. For each plot the left-hand axis shows the laboratory-provided radiocarbon concentration in years BP and the bottom axis gives an age in calendar years. The blue line shows the standard radiocarbon concentrations for the tree rings to within ± 1 standard deviation which are then used to help correlate the radiocarbon in the new samples. The red curve on the left-hand axis shows the radiocarbon determination in each of the new samples and the grey histogram on the bottom axis show the possible ages that the new sample could be. The more likely a particular age is, the higher the histogram peak is, however, usually the age of the sample is given as a range of dates which have a 95.4% probability that the sample falls within them (ORAU, pers comm. 2010).

The result of the charcoal collected from Hand-dug Pit 1 is shown in Figure 3.1a. The plot shows that the uncalibrated date of 448±25 has a 95.4% chance of having an age between 1419 and 1470 AD, which is the equivalent to a calibrated age of 506 ±26 years cal BP. Figure 3.1b shows the calibration plot produced for the radiocarbon result from the charcoal collected from Trench 2 on Vulcanello. It shows that the uncalibrated date of 461±26 has a 95.4% chance of having an age between 1414 and 1458 AD, which is the equivalent to a calibrated age of 514 ±22 years cal BP.

Figure 3.1c shows the calibration plot produced for the radiocarbon result from the charcoal collected from Trench 4 on Vulcanello. It shows that the uncalibrated date of 1795±27 has a 95.4% chance of having an age of between 132 and 325 AD. Within this range, there is an 80.2% chance that the age is between 132 and 260 AD and a 15.2% chance of having an age of between 282 and 325 AD. This is the equivalent to the sample having a calibrated age of 1722 ±97 years cal BP. Figure 3.1d shows the calibration plot produced for the radiocarbon result from the charcoal collected from Hand-dug Pit 2 on Vulcanello. It shows that the uncalibrated date of 717±22 has a 95.4% chance of having an age of between 1260 and 1298 AD, which is the equivalent to a calibrated age of 671 ±19 years cal BP.

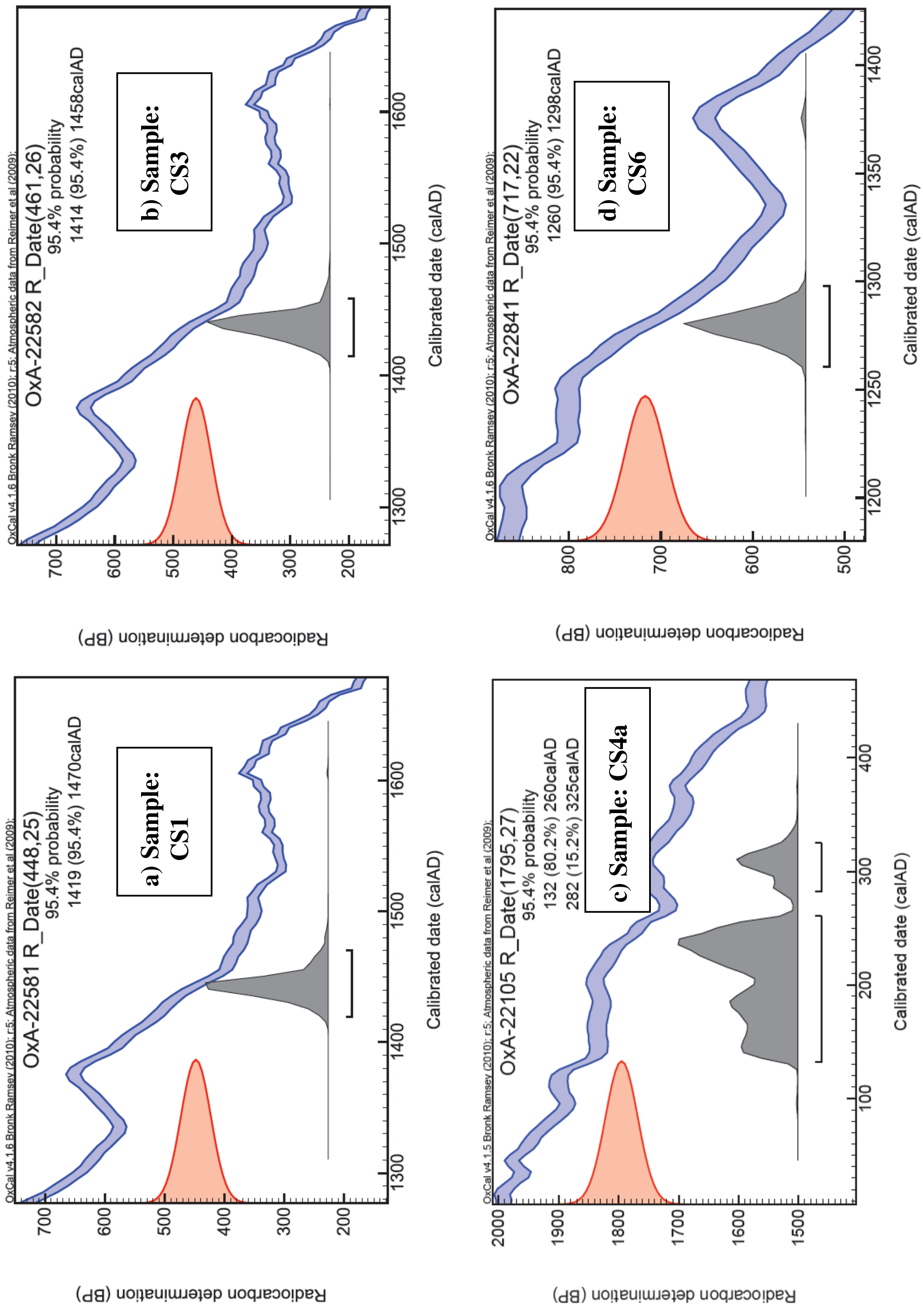


Figure 3.1: The calibration plots produced by the Oxcal computer program (v4.0) using the uncalibrated dates produced by the ORAU. The blue line shows the standard radiocarbon concentrations for the tree rings to within ± 1 standard deviation.

Three out of the four charcoal samples from Vulcanello have ages that are internally consistent. However, the fourth age is 1000 years older and as such considered to be anomalous. One explanation for this is that the sample may contain older charcoal which has been entrained during the Commenda eruption. Another possible explanation is that previous anomalous radiocarbon ages are known to have been caused by the original plant growing near to a volcanic fumarole (Bruns et al, 1980). Modern-day plants, growing near to an area of known $CO_2$ degassing in western Germany, record a $^{14}C$ deficiency compared to modern-day atmospheric radiocarbon levels. This deficiency caused by radiocarbon-depleted $CO_2$ meant that the amount of $^{14}C$ in the plant gave a radiocarbon age of up to 1500 years older than the actual plant age (Bruns et al, 1980). Bruns et al. (1980) also found that this effect only occurred within a limited distance (up to 200 m) decreasing rapidly from the fumarole. This explanation for the older radiocarbon age cannot be properly evaluated because the existence of volcanic fumaroles is unknown for Vulcanello at the time of the Commenda eruption of La Fossa as the only record of fumarolic activity on Vulcanello is within the crater of Vulcanello III at the end of the 19$^{th}$ century (Arrighi et al, 2006)

As all the charcoal samples were collected from a fall deposit above the white Monte Pilato marker layer they are presumed to be younger than that tephra layer as there is no evidence of re-working of older deposits. The possibility that the sample could have been reworked from an older unit was considered but no evidence of re-working above the white M Pilato marker layer was seen in the field.

The Monte Pilato tephra has an age of ~700 BP (from archaeomagnetic dating) to ~1200 BP (radiocarbon dating), so it is unlikely that the age of Sample CS4 from Trench 4 is correct as it is *ca.* 1700 BP older than either of the M Pilato ages. Also, the lava platform found at the base of Trench 4 has been dated as 700 - 850 BP (Arrighi et al, 2006). The wider spread in age of the radiocarbon result from Trench 4 is probably due to the small fragments of charcoal that were dated were in fact from several different plants (Bronk Ramsey, pers comm. 2010).

After consideration of the radiocarbon produced dates, it is probable that the Commenda Ash eruption from La Fossa occurred between 1260 and 1470 AD according to the $^{14}C$ data presented herein.

## 3.4 Chronostratigraphy

Before the chronostratigraphy of Vulcano can be defined, we need to consider the stratigraphic order of the samples recently re-defined by Di Traglia during his PhD at the University of Pisa (pers comm. 2011). The new stratigraphic order is shown in Figure 3.2 including the eruptions of La Fossa and Vulcanello. Figure 3.2a shows all the dates detailed in Table 3.1 plotted against the accepted stratigraphic order and Figure 3.2b those dates which are believed to be correct.

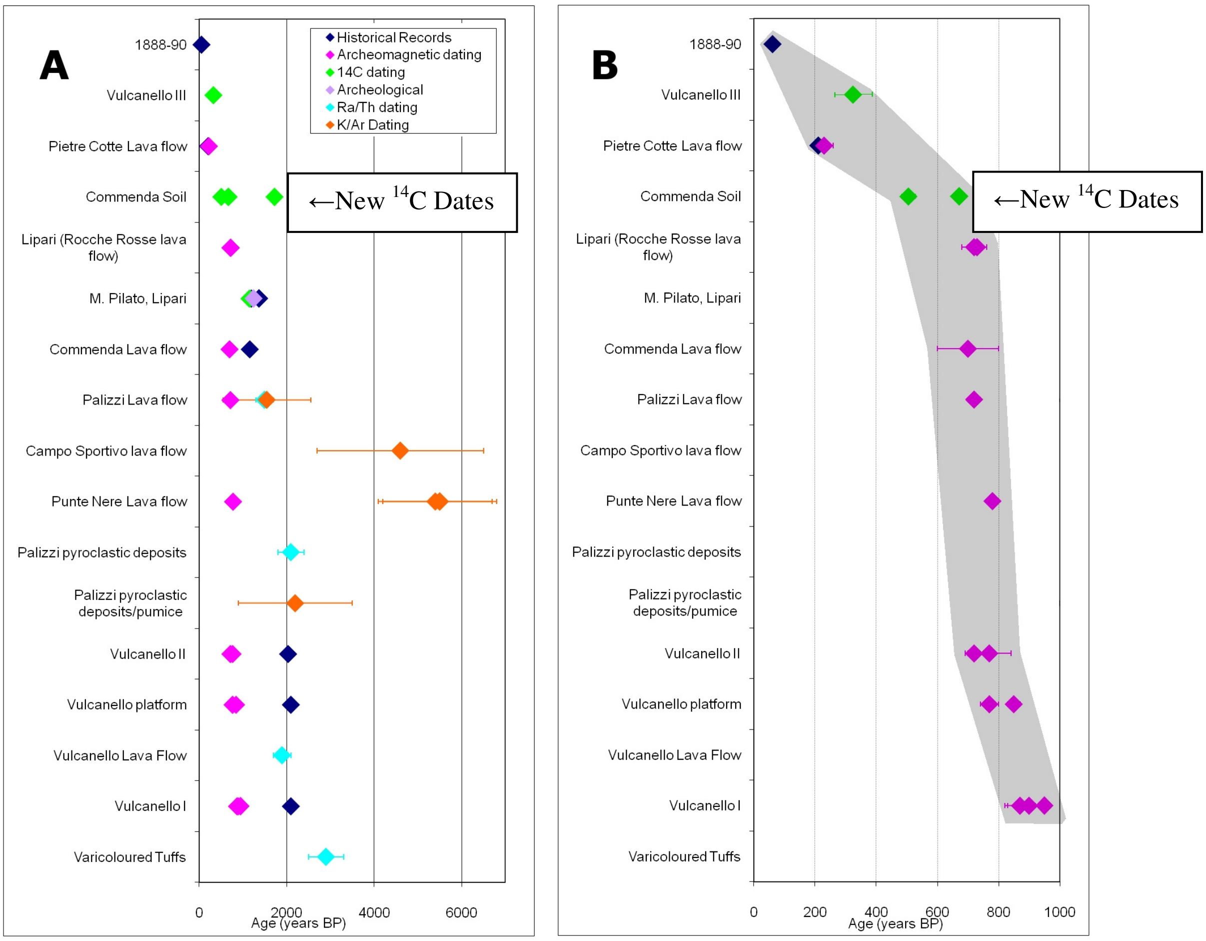


Figure 3.2: A: compilation of all the dates for La Fossa and Vulcanello against the stratigraphic order of the erupted units. B: the most accurate dates and stratigraphy thus defining a chronostratigraphy (Data from: Arrighi et al; 2006; Cortese et al; 1986; DiRoberto et al; 2008; Frazzetta et al; 1983; Frazzetta et al; 1984; Johnson-Lavis et al; 1891; Keller; 1970; Keller; 2002; Tanguy et al; 2003; Voltaggio et al; 1995)

The historical records date of 61 BP corresponds with the 1888-90 eruption and is undisputed by all works. The other date deduced from historical records is the 1739 AD date given to the Pietre Cotte lava flow and is supported by the date produced through archaeomagnetism. Although the $^{14}C$ date for the youngest of the Vulcanello units (Vulcanello III) has a relatively large uncertainty, overall it fits within the stratigraphy. Of the new $^{14}C$ dates for the Commenda, three are chronostratigraphically acceptable but the fourth has been discounted. For the samples older than the Commenda, the dates that were produced though archaeomagnetic dating are considered the most acceptable and show that the entire stratigraphic sequence was erupted within the last 1000 years. Ra-Th dating constrains the maximum possible age of 3000 BP.

The diagram in Figure 3.2b, shows that contrary to the discrete cycles hypothesized by Frazzetta et al (1983), La Fossa and Vulcanello erupted frequently for approximately 200 years forming the deposits known as the Palizzi, Commenda and Vulcanello I and II. Then there was a period of quiescence before another, more recent period of activity forming the Pietre Cotte and 1888-90 deposits, as well as the deposits of Vulcanello III.

## 3.5 Conclusions

- $^{14}C$ dates from La Fossa and Vulcanello reveal that the eruption from La Fossa that produced the Commenda Ash occurred between 1260-1470 AD
- Charcoals occur in Commenda pyroclastic deposits that post-date the Monte Pilato (Lipari) marker horizon (*ca.* 1230 AD) and the lava platform (*ca.* 1100 AD) and as such are chronostratigraphically acceptable.
- $^{14}C$ ages that are older are possibly older charcoal which was entrained during a fall event
- Ra-Th dating yields a possible maximum age for the section at 3000 BP
- Chronostratigraphic considerations indicate that both La Fossa and Vulcanello formed in the last 1000 years BP or possibly up to 3000 years BP if Ra-Th data are included.

## 3.6 References

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# Chapter 4: Geochemistry

## 4.1 Introduction to Whole Rock Analysis

According to recent research carried out by Gioncada et al (2003) and Peccerillo et al (2006), the magma plumbing system beneath the La Fossa vent on Vulcano, Italy is made up of two magma systems: a shallow, evolved, felsic component and a deeper, less evolved, mafic component. Previous geochemical work has tended to investigate either the large range in magma composition found throughout the Aeolian Islands though inter-island comparison or the variations that are found on Vulcano over long time scales (100 ka to 1 Ma). Previous authors have generally agreed that the overall range of magma compositions is due to the fact that several different sources and multi-component processes are involved (De Astis et al. 2000). Also, further variation in the magma may be due to the occurrence of fractional crystallisation (FC) and assimilation fractional crystallisation (AFC) (Ellam & Harmon 1990). Previous studies of Vulcano, have investigated the temporal changes in the petrology and chemistry over timescales of 100 Ka to 1 Ma years (De Astis et al, 2000, Gioncada et al, 2003), however, this research project is going to focus on only the recent history at the La Fossa and Vulcanello eruptive centres on Vulcano and any small scale cyclicity found within the eruptive cycles.

The main aims of this research were to carry out a comprehensive study of stratigraphically constrained effusive (i.e. lavas) and explosive (i.e. pyroclastic) rocks from Vulcano. This was undertaken to evaluate:

(a) the variation in geochemistry at La Fossa and Vulcanello and the similarities or differences between these juxtaposed volcanic centres;

(b) the interaction of the mafic and felsic magma systems which are thought to co-exist beneath Vulcano;

(c) the evidence for deep subduction-related input;

(d) the temporal changes at both volcanic centres;

(e) to consider which high level processes best explain the chemical variation (i.e., fractionation, assimilation), and

(f) to decide to what extent geochemistry can be used for inter-island correlations.

Fieldwork was carried out on Vulcano (on both La Fossa and Vulcanello) and on Lipari over four different seasons in collaboration with the University of Pisa, Italy. Further samples were obtained from the University of Pisa and the descriptions of the locations of these samples are from Federico Di Traglia (pers comm. 2010). The samples were collected from a range of natural outcrops and from a series of mechanically or hand-dug trenches. Trenching with both a mechanical JCB and by hand was undertaken at various locations on the slopes of the La Fossa cone and on the Vulcanello lava platform. The aim of the fieldwork was to collect juvenile samples of tephra, ash and lava from key deposits throughout the stratigraphies of the both the La Fossa and Vulcanello eruptive centres. The Monte Pilato white ash layer from an eruption on Lipari was collected because it forms a prominent tephra marker layer on both La Fossa and Vulcanello. This layer is important for inter-island correlations. For further details of the samples, see Appendix B.

These samples were investigated using whole rock (ICP-AES, ICP-MS) and micro-beam techniques (EMPA, LA-ICP-MS).

## 4.2 Major and Trace Element Whole Rock Geochemistry

Major, minor and trace element geochemistry concentrations of about twenty-four samples were determined using an Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) for the major and minor elements and an Inductively Coupled Plasma Mass Spectroscopy (ICP-MS) for trace element analysis. A full description of the sample preparation and analysis methodology can be found in Appendix C. Standards (AGV-2 and BCR-2) were also run with some of the samples to check the accuracy and precision of the analysis.

The twenty-four samples chosen for whole rock geochemical analysis were taken from locations of known stratigraphic height from throughout the La Fossa cycles, as well as from the three eruptive centres of Vulcanello. The whole rock analysis was undertaken to provide preliminary results before further, more detailed analysis of individual juvenile glasses was carried out. The whole rock analysis is useful as it is quicker and cheaper to obtain results than the glass analysis and can provide a picture of the overall processes that are occurring. It is also helpful as the whole rock results can give an indication of where further work should be targeted.

Table 4.1 provides a key to the symbols used in the following figures and representative analytical major, minor and trace element data are displayed in Table 4.2.

| Symbol | Sample Cycle | Eruption Style | Eruption location |
|---|---|---|---|
| △ | 1888-90 & Pietre Cotte | explosive | La Fossa |
| ◇ | Commenda | explosive | La Fossa |
| ◆ | Commenda | effusive | La Fossa |
| □ | Palizzi | explosive | La Fossa |
| ■ | Palizzi | effusive | La Fossa |
| △ | Vulcanello III | explosive | Vulcanello |
| ◇ | Vulcanello II | explosive | Vulcanello |
| □ | Vulcanello I | explosive | Vulcanello |
| ○ | Monte Pilato | explosive | Lipari |

Table 4.1: Key to samples and symbols used in the geochemical diagrams

| Oxide/element | unit | Pietre Cotte | Lower Pietre Cotte | Palizzi Lava | Palizzi Rhyolite | Vulcanello III | Vulcanello I | M. Pilato |
|---|---|---|---|---|---|---|---|---|
| | | AT1 | LPC1 | RVULC 07-9 | RVULC 07-46 | AT2 | AT8 | AT11 |
| SiO2 | wt% | 59.63 | 54.85 | 59.26 | 68.12 | 56.94 | 51.93 | 72.61 |
| Al2O3 | wt% | 15.68 | 15.96 | 16.32 | 14.68 | 16.17 | 15.32 | 13.86 |
| FeOt | wt% | 6.54 | 8.12 | 6.21 | 3.32 | 7.19 | 9.10 | 2.47 |
| MgO | wt% | 2.82 | 3.72 | 2.04 | 1.30 | 3.15 | 4.98 | 0.27 |
| CaO | wt% | 5.30 | 6.67 | 4.42 | 2.22 | 5.84 | 8.77 | 1.27 |
| Na2O | wt% | 3.85 | 3.95 | 4.45 | 3.29 | 4.15 | 3.68 | 3.96 |
| K2O | wt% | 5.29 | 5.54 | 6.36 | 6.63 | 5.52 | 4.96 | 5.30 |
| TiO2 | wt% | 0.46 | 0.63 | 0.50 | 0.23 | 0.55 | 0.68 | 0.15 |
| P2O5 | wt% | 0.30 | 0.42 | 0.31 | 0.09 | 0.37 | 0.43 | 0.03 |
| MnO | wt% | 0.12 | 0.15 | 0.13 | 0.12 | 0.14 | 0.16 | 0.07 |
| Original Total | wt% | 97.2 | 100.6 | 97.9 | 94.3 | 100.1 | 99.6 | 96.4 |
| Alkali | (K+Na) | 9.14 | 9.49 | 10.81 | 9.92 | 9.67 | 8.64 | 9.26 |
| Ba | ppm | 703 | 998 | 814 | 252 | 899 | 1038 | 103 |
| Sr | ppm | 816 | 1124 | 855 | 192 | 1021 | 1273 | 107 |
| Y | ppm | 32 | 30 | 31 | 39 | 29 | 26 | 42 |
| Zr | ppm | 205 | 203 | 271 | 244 | 210 | 154 | 167 |
| Co | ppm | 9.5 | 19.6 | 12.4 | 4.5 | 14.6 | 23.8 | 0.3 |
| Cu | ppm | 72 | 137 | 99 | 59 | 78 | 127 | 18 |
| Ni | ppm | 11 | 16 | 7 | 3 | 9 | 18 | 1 |
| Sc | ppm | 8 | 16 | 8 | 4 | 9 | 21 | 2 |
| V | ppm | 114 | 163 | 110 | 37 | 140 | 204 | 19 |
| Rb | ppm | 195 | 170 | 205 | 240 | 181 | 140 | 229 |
| Nb | ppm | 23 | 18 | 24 | 31 | 23 | 17 | 26 |
| La | ppm | 75 | 70 | 88 | 87 | 73 | 63 | 52 |
| Th | ppm | 36.9 | 27.9 | 39.3 | 50.6 | 33.4 | 22.4 | 38.6 |
| Y | ppm | 29.3 | 26.4 | 27.6 | 36.9 | 26.6 | 22.7 | 36.7 |
| Ce | ppm | 124 | 115 | 141 | 143 | 122 | 105 | 91 |

Table 4.2: Table showing a representative selection of major and trace element data derived from ICP-AES and ICP-MS analysis.

Figure 4.1 shows mantle - normalised trace element abundances as well as chondrite - normalised rare earth element abundances for La Fossa, Vulcanello and Monte Pilato. In general the rocks have a similar overall profile shape but with differences in the level of enrichment. This indicates similar magmatic processes (both deep and shallow) have occurred during their formation. Overall the Vulcanello magmas are the least fractionated, overlapping with the La Fossa magmas which in turn overlap with the most fractionated Mt Pilato magmas from Lipari.

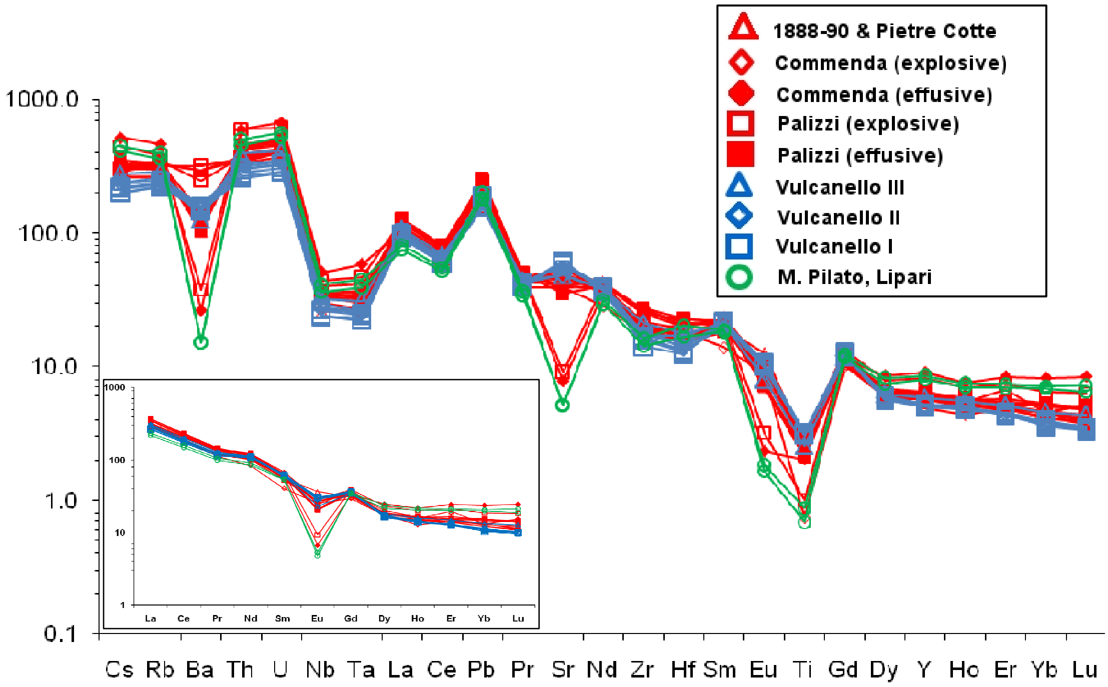



Figure 4.1: Mantle-normalised trace element diagram for La Fossa, Vulcanello and M. Pilato rocks. Normalising values are from Sun & McDonough (1989). The inlay shows a chondrite-normalised trace element abundance diagram for the same samples.

Mantle processes are apparent in the form of the ubiquitous HFSE (High Field Strength Elements) depletion (i.e. Nb-Ta-Zr-Hf-Ti) which confirms a supra-subduction origin for the island of Vulcano, which is unsurprising as it is part of the Aeolian island arc. However, shallow crustal processes are also indicated by the variable level of enrichment shown particularly in Nb, Ta and the HREE (Heavy Rare Earth Elements), and also in various elemental anomalies (i.e., Ba, Sr, Eu, Ti). Fractional crystallisation is likely to be occurring and the formation of feldspar (both alkali [Ba] and plagioclase) as well as possibly magnetite or ilmenite (Ti depletion) reveals the high level fractionation processes. As, Ba, Sr, Eu and Ti are preferentially taken into the feldspar structure, if feldspar fractionation is occurring it will also lead to depletion of these elements in the most fractionated liquids. The two samples of the Monte Pilato eruption (Lipari) along with the most evolved La Fossa deposits (the Palizzi 'Rhyolite' and the effusive Commenda) show the most evidence of feldspar fractionation.

Figures 4.2 and 4.3 are used to determine the classification of the rocks and to illustrate chemical variability. Published whole-rock data from La Fossa and Vulcanello is shown for comparison but previous work has tended to group the samples to be either pre or post 15 ka, which is when the La Fossa Caldera is thought to have formed (Del Moro et al, 1998) or split into pre or post 30 ka when a transition from calc-alkali to more potassium - rich magma occurred (Ellam et al, 1988, De Astis et al, 2000) rather than data from individual stratigraphically constrained samples.

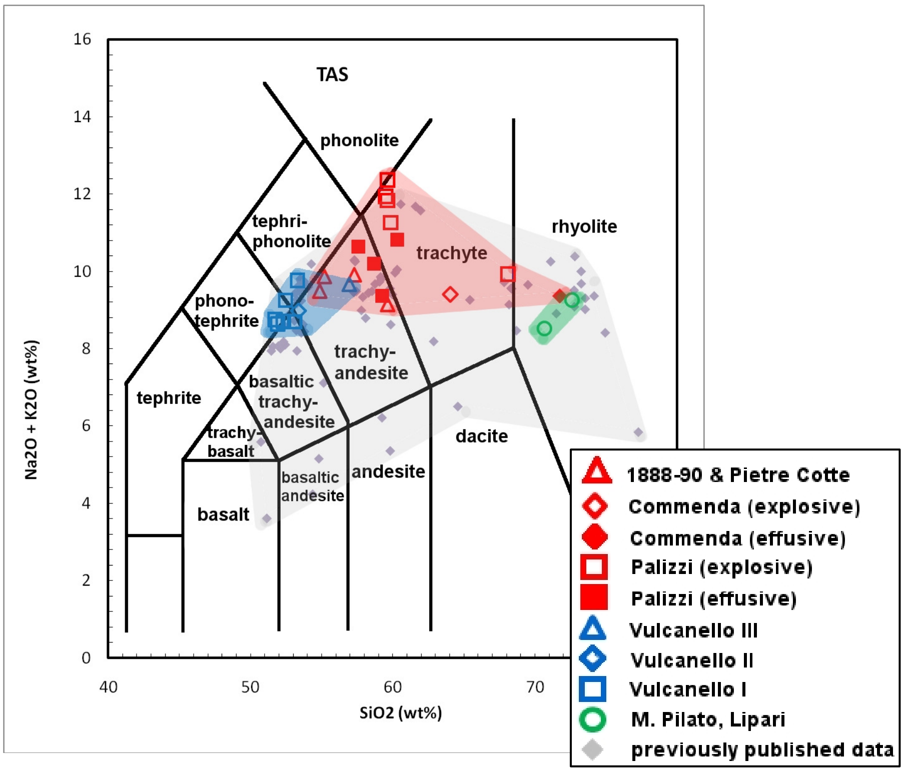



Figure 4.2: Alkali (Na2O + K2O) vs. Silica (SiO2) Diagram. Comparative data all normalised to 100 (wt%) are from various sources (Aparicio et al, 2008, Barberi et al, 1974, Davi et al, 2009, De Fino et al, 1991, Del Moro et al, 1998, Ellam et al, 1988, Gioncada et al 1998 & Gioncada et al 2003).

Figure 4.2 indicates that generally the La Fossa samples are more evolved than those from Vulcanello. The most evolved samples which were analysed are from Monte Pilato, Lipari eruption. The La Fossa rocks range from trachy-andesites to rhyolites whereas the Vulcanello rocks generally plot in the upper parts of the basaltic trachy-andesite and trachy-andesite fields and in the lower parts of the phono-tephrite and tephra-phonolite fields. The youngest La Fossa deposits and the Pietre Cotte cycle are trachy-andesites. The previous cycle of the Commenda erupted explosive (trachyte) and effusive (rhyolite) deposits. The oldest deposits from the La Fossa vent are from the Palizzi cycle. This cycle ended with the effusive activity of several different lava flows (Di Traglia, pers comm. 2009) which are mainly trachy-andesites or trachytes. There are several different explosive deposits associated with the Palizzi cycle including those termed the 'Palizzi Trachyte' and the 'Palizzi Rhyolite' but the limited whole rock analysis database only confirms the presence of trachytes. The youngest deposit from the Vulcanello eruptive centre is a trachy-andesite, but the older deposits of Vulcanello I and Vulcanello II are basaltic trachy-andesites.

All the effusive and explosive products from Vulcano (both La Fossa and Vulcanello) plot in the shoshonitic field (Peccerillo and Taylor, 1976) (Figure 4.3). The La Fossa deposits range from shoshonite to rhyolite with the majority falling in the latite field. The older deposits from Vulcanello are mostly shoshonites with the youngest deposit of Vulcanello III plotting as a latite. The M. Pilato deposits from Lipari plot in the rhyolite field.

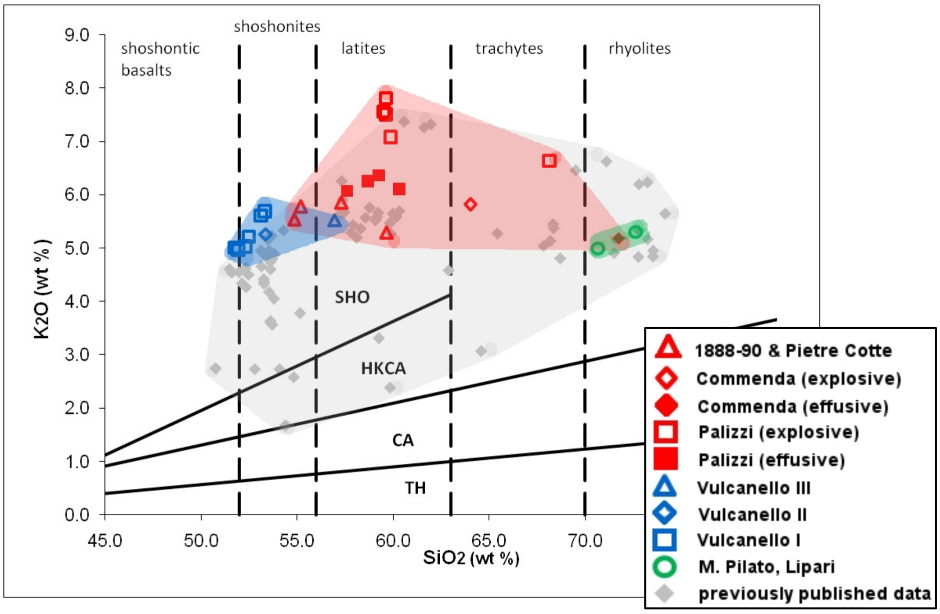



Figure 4.3: K2O vs. SiO2 (wt%) classification diagram (Peccerillo & Taylor, 1976). Previously published data included for comparison - data all normalised to 100 (wt%) are from various sources (Aparicio et al, 2008, Barberi et al, 1974, Davi et al, 2009, De Fino et al, 1991, Del Moro et al, 1998, Ellam et al, 1988, Gioncada et al 1998 & Gioncada et al 2003).

Whole rock major and trace element geochemical data are plotted on selected Harker variation plots (4.4 and 4.5) with previously published data included for comparison. Overall the variation observed in the stratigraphically constrained samples is identical to that observed in previous work and encompasses most of the variation. Generally with the exception of $K_2O$ and $Na_2O$, the major elements decrease in concentration with increased fractionation (increased $SiO_2$). Variation of CaO and $Al_2O_3$ may be largely due to fractionation of plagioclase feldspar as there is no marked change in $K_2O$ and $Na_2O$ as would be apparent with alkali feldspar removal. There is also no marked change in the trace elements of Eu or Sr (Figure 4. 5). There is some indication of a decrease in $Na_2O$ in the explosive Commenda as well as the more evolved explosive 'Palizzi Rhyolite' deposits which may indicate some involvement of alkali feldspar. Coupled changes in $TiO_2$ and FeO may implicate oxides (Ti-magnetite) in late stage fractionation processes. One slight anomaly to the general trends is seen in the Palizzi explosive deposits ($SIO_2$ ~60 wt%) as they have higher values of $Al_2O_3$ and $K_2O$ than expected. These data points are all from the 'Palizzi Trachyte' deposits and the anomaly is probably due to the deposit having a larger concentration of alkali feldspar crystals than the other deposits from La Fossa.

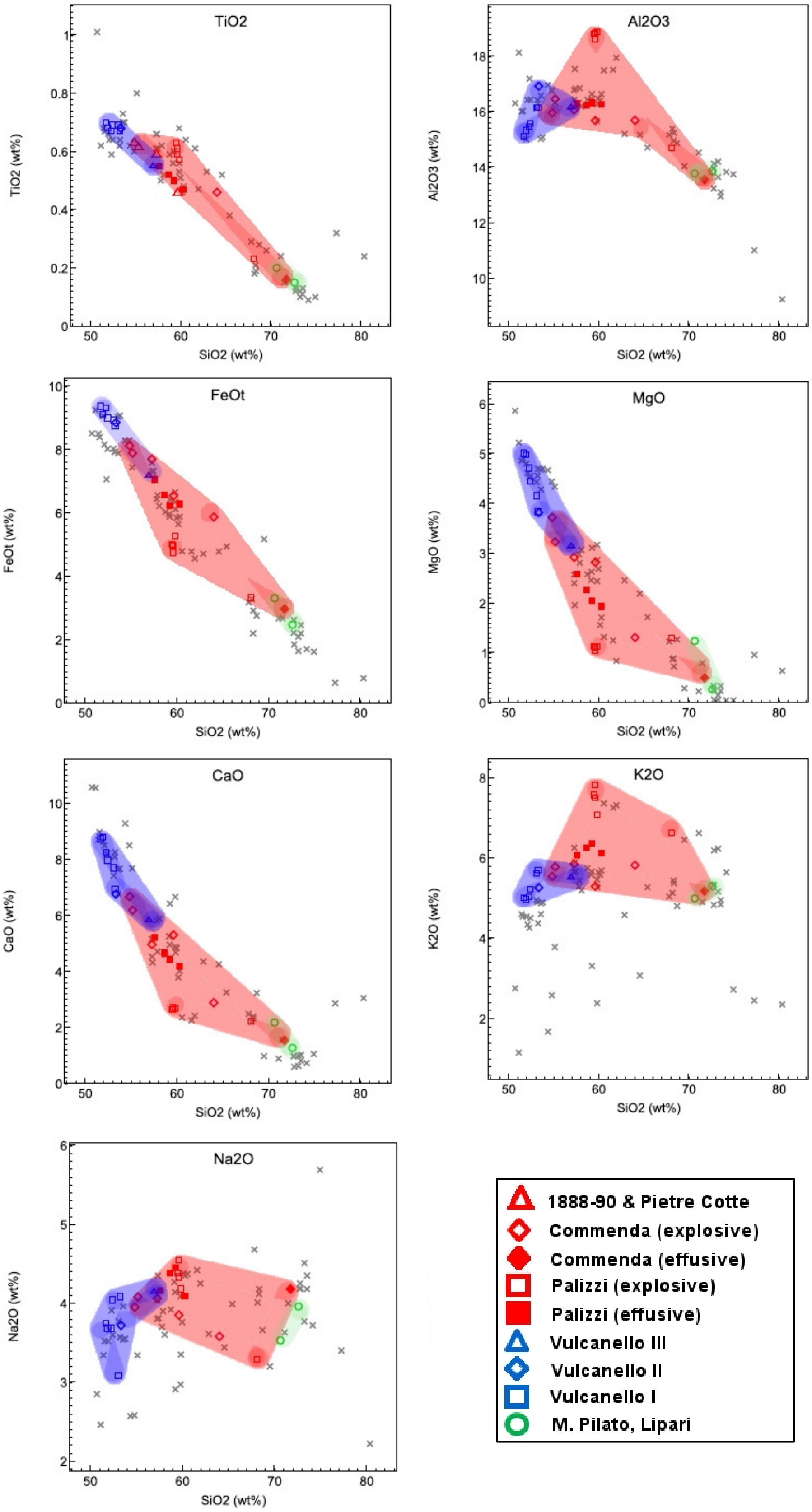



Figure 4.4: Harker variation plots for selected major elements. Other published data are indicated by grey crosses for comparative purposes (Aparicio et al, 2008, Barberi et al, 1974, Davi et al, 2009, De Fino et al, 1991, Del Moro et al, 1998, Ellam et al, 1988, Gioncada et al 1998 & Gioncada et al 2003).

The least evolved magmas are those from the Vulcanello eruptive centre and have the lowest concentrations of $SiO_2$ and higher concentrations of most of the other major and minor elements as shown in Fig 4.4, with the exception of $Na_2O$ and $K_2O$. The Vulcanello I and Vulcanello II rocks are similarly less fractionated becoming more fractionated with time before forming the Vulcanello III deposits. This is interesting and fits with observations in the field that showed that the Vulcanello I and II centres erupted at a similar time and that Vulcanello III erupted after a period of quiescence. Clearly during that time fractional crystallisation occurred within the magma chamber.

Field observations also show that Vulcanello I was erupted at a similar time to the Palizzi cycle on La Fossa. At the end of the Palizzi Cycle three lava flows were erupted from different parts of the cone. The lava flows occur in the same stratigraphic level with a slight range in $SiO_2$ composition (58-60 wt%).

The cycle which occurred after the Palizzi was the Commenda. The oldest part of this cycle was a lava flow and it is the most evolved of all the La Fossa deposits analysed. The large difference in composition of this lava and the three previous lava flows could possibly suggest that there was a long period of quiescence between the two cycles giving time for the magma chamber below to evolve. However, there is no evidence of a long period of quiescence (recent dating has shown that the time interval between the lava flows was probably only in the order of several hundred year) which means that the difference in composition of the lava flows can be taken as proof of the existence of two co-existing different magma chambers. The explosive part of the Commenda cycle is less evolved than the effusive part of the cycle and has a silica concentration of ~64 (wt%). The least evolved of the La Fossa deposits are from the most recent cycle of the Pietre Cotte.

Trace element Harker plots in Figure 4.5 generally show that the minor and trace element geochemical whole rock data for La Fossa and Vulcanello agrees with the major geochemical data. It is possible to see that similarly, to the most of the major elements, there is an overall decrease in the concentration of Sr with the increase in fractionation (higher $SiO_2$), probably due to the fractionation of feldspar. Conversely, with increasing silica concentration, Rb and Th both increase, with the concentration of Zr varying little with a change in $SiO_2$ concentration, possibly indicating that any deep mantle processes are affecting all the samples similarly.

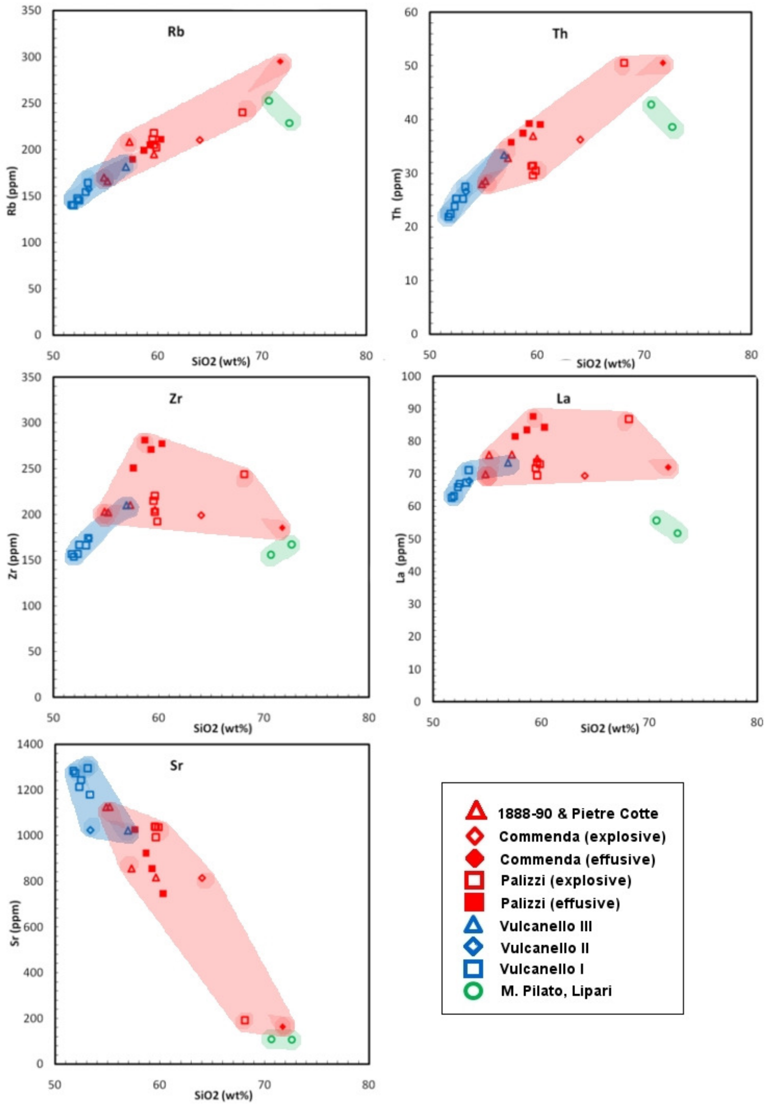



Figure 4.5: Harker variation plots for selected minor and trace elements.

### 4.2.1 Temporal Changes in Magma Geochemistry at La Fossa and Vulcanello

Investigation of the temporal changes in magma chemistry is made possible due to the stratigraphically and chronologically constrained samples. Overall, the Vulcanello eruptive centre is simpler than that of La Fossa and the magmas are less fractionated. By looking in detail at Figure 4.6, it is possible to see that the temporal changes from Vulcanello I to III shown are over a time period of several hundred years. This means that by investigating the data, it allow us to evaluate the extent to which the magma has changed in that time period. In that short time period there is no marked change in magma chemistry between Vulcanello I and II but Vulcanello III appears to be more fractionated with a higher level of overall elemental enrichment and more marked Ba and Sr anomalies. This may point to minor amounts of high level fractionation beneath Vulcanello and indicated that the magma beneath Vulcanello is a single batch as hypothesised by Davi et al (2009).

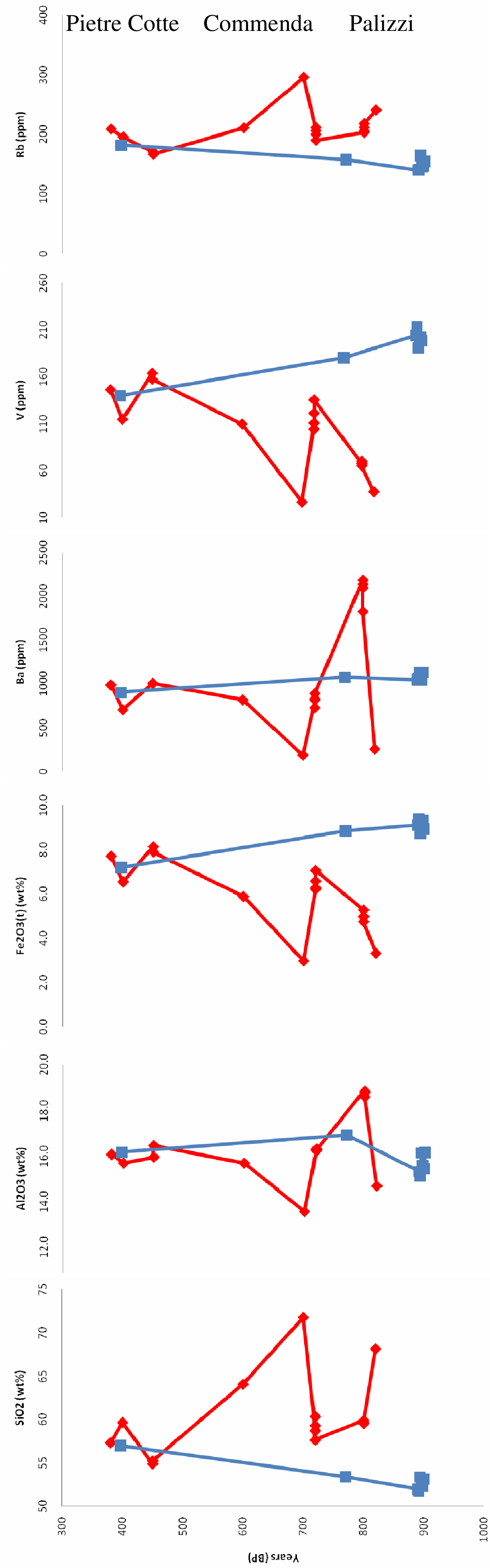



Figure 4.6: Magma chemistry vs. time (i.e., stratigraphic height). La Fossa (red) and Vulcanello (blue) magmas are shown with relative stratigraphic height deduced from fieldwork (Di Traglia, pers comm. 2009 & 2010) and ages (see Chapter 3).

For La Fossa, Figure 4.6 shows how the $SiO_2$ content of the magmas varies over time in a non uniform way between 55 and 70% $SiO_2$. Firstly, there is apparent magmatic cyclicity of the eruptive units which indicates that La Fossa is fed by several magma batches. Secondly, within the cycles there is systematic change in magma composition. From the whole rock geochemical data, both the Palizzi and Commenda cycles appear to begin with the eruption of more evolved magmas with eruption of progressively less fractionated magmas with time. This may indicate the existence of fractionated chambers that are being emptied (top to bottom) and/or the trigger of the eruption being caused by the influx of less fractionated magma.

For Vulcanello (Figure 4.6) the temporal magmatic evolution is very different. Compared with La Fossa, no cyclicity is seen in Vulcanello which may be due to volcanism at Vulcanello being due to a single magma batch. Alternatively no systematic change in magma composition exists within the cycles because the magma is more uniform in composition. Also the Vulcanello magmas are unfractionated relative to the majority of the La Fossa magmas. Vulcanello I and Vulcanello II erupted relatively rapidly, followed by a time interval of several hundred years before the eruption from Vulcanello III. This time interval, gave the magma time to become slightly more evolved through fractional crystallisation. This can be seen in the plot of $Al_2O_3$ as the highest concentration of $Al_2O_3$ is ~17 (wt%) for the deposit of Vulcanello II before decreasing slightly to ~16 (wt%) for Vulcanello III. The decrease of Al with a corresponding increase in Si shows that it is possible that feldspar fractionation is occurring. For the minor and trace elements of Ba, V and Rb, the concentrations of Ba (1127 ppm to 899 ppm) and V (202 ppm to 140 ppm) decrease over time from Vulcanello I up to Vulcanello III. Over the same time the concentration of Rb increases from 140 ppm to 181 ppm.

It is interesting to note that when the two centres of La Fossa and Vulcanello were erupting at a similar time, in the case of the younger eruptions of the Pietre Cotte (between 450 and 380 BP) and Vulcanello III (~397 BP), the geochemical composition of these two deposits are similar. Trenches dug on Vulcanello revealed that the deposits of Vulcanello III lie between the Lower and Upper Pietre Cotte deposits. Figure 4.6, shows that the data from Vulcanello III plots between the Lower and Upper Pietre Cotte.

## 4.3 Conclusions from Bulk Rock Analysis

- Chemical variation in the explosive and effusive rocks is identical to the published data reported for Vulcano.
- La Fossa and Vulcanello magmas are broadly from a calc-alkaline, shoshonitic series (shoshonitic basalt - latite - rhyolite).
- Deep mantle contributions to the magmas are apparent in the ubiquitous depletion in HFSE (Nb-Ta-Zr-Hf).
- Shallow crustal processes affect the La Fossa magmas and involve fractionation of plagioclase, alkali feldspar and magnetite which is evident in major (Ca, Al), minor (Ti) and trace element (Sr, Ba, Eu) variations.
- La Fossa magmas evolved by influx of repeated batches of magma (2-3 cycles) which can be seen as cycles of chemical variation. The magmas ponded and fractionated and were erupted possibly due to the influx of less fractionated magma which acted as a trigger. The cycle typically begins with eruption of fractionated magma and progressively the magmas become less fractionated.
- Vulcanello, by contrast, evolved by influx of single magma batch which ponded beneath Vulcanello and then fractionated over time (100-200 years) to a minor degree prior to eruption.
- Chemical similarities between the Vulcanello magmas and the least fractionated La Fossa magmas may support a link between the magma systems. This will be further investigated by analysis of juvenile glass data in the next section.

## 4.4 Introduction to Glass Analysis

Glass geochemical data was obtained on individual juvenile clasts from explosive and effusive deposits from the La Fossa and Vulcanello eruptive centres, as well as the explosive Monte Pilato eruption from Lipari. Glass analysis was undertaken on the same samples previously analysed by ICP-AES and ICP-MS for several reasons. First, bulk analysis can generate compositions which may be magmatically meaningless if the sample contains many phenocrysts. Also, small scale magma mixing, on the scale of an individual clast, would be obscured and any fine detail would be lost by the process of bulking.

The main aim of the juvenile glass analysis is to better understand the possible temporal link between the felsic and mafic magma systems of La Fossa and Vulcanello. In addition glass analysis provides a more complete picture of the chemistry of the eruptive cycles than bulk analysis because of the effects of phenocrysts. With glass data it is possible to better identify the shallow and deep processes that are responsible for the chemical diversity of the magma and the tectonic setting of the island. Individual glass analysis will also be carried out on deposits of unknown origin to try to help identify the eruptive source of the unit.

## 4.5 Major Element Glass Geochemistry

Individual juvenile glass shards were mounted in epoxy resin and the solidified stub polished. Before analysing the stubs, a map of each stub surface was made and in some cases an SEM-BSE image of the individual shards was taken to aid locating optimal surfaces for analysis. Major and minor element abundances for 40 samples were determined using the Electron Microprobe Analysis on a Jeol – 8600 Superprobe at Oxford. A full description of the sample preparation and analysis methodology can be found in Appendix D. Secondary standards (atho, gor 128/132 and StHs 6/80) were also analysed with each run of the samples to check the accuracy and precision of the analysis. A full list of the new data generated by EMPA can be found in Appendix D along with the detailed data from the secondary standards.

EMP analysis does not measure H which means that in samples of hydrous glass, the totals recorded are usually <100%. Only data with totals of >95% (>93% in the case of rhyolites) were used and all the data was normalised to 100 wt% to aid comparison before being used.

Figure 4.7a shows the juvenile glass data for La Fossa, Vulcanello and Monte Pilato, Lipari, as well as the whole rock data (as black crosses) from the previous section. From Figure 4.7, it is clear that the glass analyses differ from the bulk rocks analyses in several ways. Although the glass data defines a similar general trend as the bulk rock data, of increasing alkali concentration with increasing silica, the glass data have higher $SiO_2$ and higher total alkali values. Like the whole rock data the glass data reveals that the most evolved magmas are from Monte Pilato, Lipari, the La Fossa glasses are more evolved than those from Vulcanello, and that the bulk of the Vulcanello glasses are the least evolved of all the glasses. However there are important details in the glass data that were not apparent in the whole rock data. First the Vulcanello glass data has a greater compositional spread than the bulk rock revealing that the Vulcanello deposits have a compositional overlap with La Fossa. The glass data also highlights the fact that the La Fossa and Vulcanello deposits cover a continuous range in geochemical composition with Mt Pilato from Lipari, as the most highly evolved/fractionated glass.

Figure 4.7b shows a detailed comparison of the whole rock (bulk) and glass data for the Commenda Lava. The error bars shown are deduced from the secondary standards which were included in the analytical runs. The secondary standards used were chosen as they were chemically the most similar in composition to the Commenda Lava: AGV-2 for the whole rock and for the glass it is atho. Despite the Commenda Lava having very few phenocrysts, there is a marked difference in the results produced by the different methods.

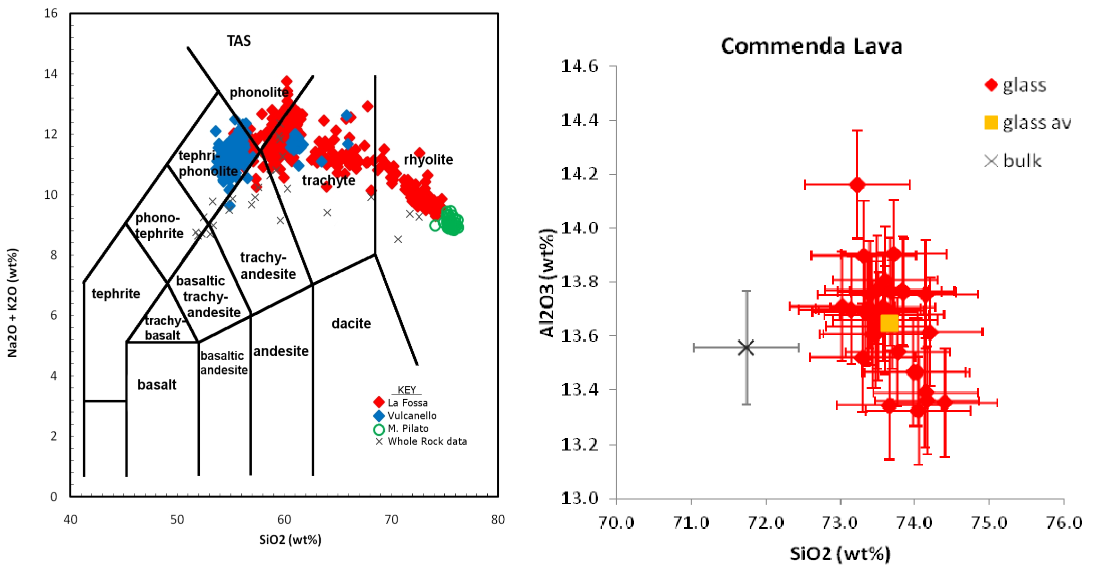



Figure 4.7a: The ($Na_2O$ + $K_2O$) vs. silica ($SiO_2$) Plot of glass data. TAS diagrams help classify the glass analyses and reveal evolution of the glass from silica oversaturated to undersaturated magmas. Juvenile data from Vulcanello is plotted in blue, from La Fossa in red and Monte Pilato in green circles. The bulk rock (ICP-AES) data is also included for comparison (black crosses).Figure 4.7b: A detailed comparison of the Commenda Lava whole rock and glass data with error bars deduced from the secondary standards (AGV-2 for whole rock and atho for the glass).

Although the glass analysis shows the fine detail of the variations in the geochemistry of the explosive and effusive deposits, it does not necessarily represent the composition of the magma below the volcano. This is because the magma chamber is also likely to contain various fractionated phenocrysts as well as xenoliths and volatiles. Melt inclusions may in fact give a better indication of the geochemistry of the magma but these will not be investigated during this research.

## 4.6 Trace Element Glass Geochemistry

Trace element glass data for individual juvenile tephra shards has been determined using LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectroscopy), with each data point representing an individual glass shard. Where possible, identical locations were analysed for both major and minor element abundances using the EPMA and LA-ICPMS respectively. Successful trace element analysis has generally been restricted to the explosive deposits as most of the effusive lavas contained too many microcrysts with the Commenda lava as the only exception.

A full description of the sample preparation and analysis methodology can be found in Appendix E. Secondary standards (atho, gor 128 and StHs 6/80) were also analysed with each run of the samples to check the accuracy and precision of the analysis. A full list of the new data generated by LA-ICP-MS can be found in Appendix E along with the detailed data from the secondary standards.

Similarly to the major and minor element glass data previously discussed in this chapter, the trace element glass data from each cycle will be discussed in a temporal sense and correlations made between the different volcano-stratigraphies so that it is possible to evaluate the petrogenesis beneath La Fossa and Vulcanello. The apparent similarities between the major and minor element geochemistry of the contemporaneous eruptions of La Fossa and Vulcanello (Palizzi A-Vulcanello I, Upper Pietre Cotte-Vulcanello III) will also be analysed in detail in order to investigate the relationship between the two eruptive centres.

<u>Temporal changes in glass chemistries</u>

In order to evaluate petrogenetic similarities and or differences beneath La Fossa and Vulcanello, the glass data from each cycle will be discussed in a temporal sense and correlations made between the different volcano-stratigraphies. For example, the oldest part of the Palizzi cycle and Vulcanello I formed at the same time (*ca*. 900 BP) and can be correlated. In addition the Lower and Upper Pietre Cotte units are separated by fall deposits from Vulcanello III which implies that the La Fossa and Vulcanello eruptive centres were active in relatively quick succession (*ca*. 325 BP). This means that it is possible to compare the geochemistry of the deposits in order to investigate the magmatic diversity of the two centres at a very similar time. From Figure 4.7 it is clear that there is a compositional overlap between the Vulcanello and La Fossa glasses and the preliminary whole rock data (Figure 4.6) reveal that the geochemistry of Vulcanello III lies in between that of the Upper and Lower Pietre Cotte.

The Palizzi Cycle, La Fossa (*ca.*900 BP)

Samples from five different Palizzi units were analysed using the electron microprobe. Four of the Palizzi samples were collected from the La Fossa cone and the fifth, which was suspected to be from the Palizzi Rhyolitic explosion, was sampled from Vulcanello. Major element data from the glass clasts from the five different units from within the Palizzi cycle are compared in Figure 4.8. The oldest part of the Palizzi cycle is sometimes known as Palizzi A (Chapter 3). The overlying explosive fall unit is known as the Palizzi Rhyolitic deposit and this is in turn overlain by another explosive unit known as the Palizzi Trachyte deposit. The youngest part of this cycle consists of three lava flows. All three of these flows have a similar bulk rock geochemistry but two of the three contain too many microcrysts for glass analysis. The remaining lava flow (the Palizzi lava flow) had enough glass for some analyses to be achieved but the anomalous data points may be due to small microcrysts being analysed as well as the glass. Overall the Palizzi Cycle deposits range in composition from tephri-phonolite to trachyte to rhyolite

The silica variation diagrams, (Figure 4.8) especially those involving Ti, Al, Fe, Mg and Ca define a curvilinear array of data and the most fractionated high silica end-member coincides with the deposit found on Vulcanello suspected to be from the Palizzi Rhyolitic explosion. The geochemistry of the Palizzi (Vulcanello) fall sample overlaps with that of the Palizzi Rhyolitic deposits found on La Fossa, although the sample from Vulcanello is slightly more fractionated than that found on La Fossa. This is probably due to the most explosive and evolved part of the eruption is distributed further from the vent.

Figure 4.8 shows that the general trends seen in the Harker variation diagrams can be due to changes in the magma composition which may be either due to fractional crystallisation occurring within the magma or within co-existing magma compositions. The Harker variation plots all show very clearly that the different units from within the Palizzi Cycle are magmatically distinct. The CaO vs. $SiO_2$ variation diagram (Figure 4.8) highlights the temporal variation in magma chemistry. The eruptive activity of the Palizzi Cycle begins with the least evolved magma (Palizzi A) which has an average concentration of 56% $SiO_2$, followed by the most evolved magma (Palizzi Rhyolite) which has a range between 69 – 74% $SiO_2$. The next explosive unit to erupt, the Palizzi Trachyte, has a less evolved geochemistry (~60 wt% Si), which is slightly more fractionated than the Palizzi A unit. Finally the effusive Palizzi lava (65% $SiO_2$) has a chemical composition between the explosive Palizzi Trachyte and Palizzi Rhyolite deposits.

This succession of explosive and effusive deposits show that magmas are not sampled sequentially from a single fractionated magma batch (felsic to mafic or mafic to felsic). There is a certain compositional cyclicity within the Palizzi Cycle which can be interpreted as evidence of possible magma chamber replenishment with batches of less evolved magma triggering an eruption perhaps from a more evolved magma batch to cause the eruption. Alternatively, it is possible that the different eruptions within the Palizzi cycle are tapping different parts of the same heterogeneous magma chamber. The overall spread of the data on the Harker variation plots shows a change in the Al vs. Si content as feldspar fractionation becomes dominant. A similar change in the trend direction can be seen in the MgO and CaO plots although it is less obvious as the elements were previously being affected by pyroxene fractionation. High level fractionation of magnetite can also be seen in the $TiO_2$ vs. $SiO_2$ and FeOt vs. $SiO_2$ diagrams.

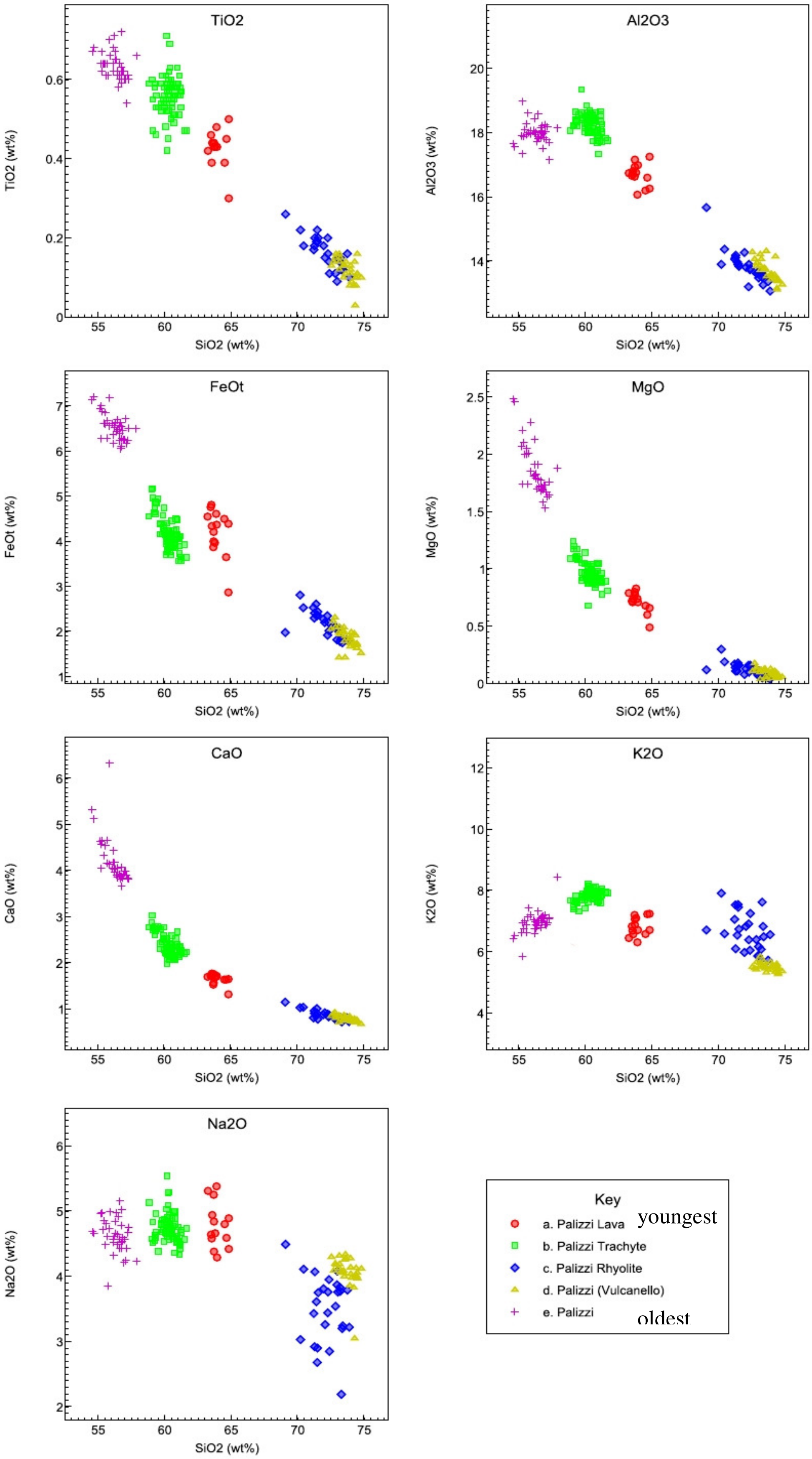



Figure 4.8: Silica variation diagrams with samples in approximate chronostratigraphic order (youngest - oldest).

Principal Component Analysis (PCA) was undertaken (for table of results, see Appendix F) to further investigate the relationship between the suspected Palizzi deposit found on Vulcanello and the proximal Palizzi Rhyolite from La Fossa. With PCA it is possible to further analyse the data by changing a number of possibly correlated variables into a smaller number of uncorrelated variables (Jolliffe, 2002). In order to carry out a PCA, the data must first be standardised so that the variable with the highest absolute values (in this case $SiO_2$) does not dominate the analysis (Pollard, pers comm. 2010). In order to carry out a PCA, there are several rules that must be followed: the axes must be re-orientated to show as much variability as possible; PC1 must be a linear combination that gives the maximum variability and PC2 must be orthogonal and shows the second most variation (Pollard, pers comm. 2010).

A PCA was carried out on the deposits from the Palizzi Cycle using the RESET Database Plotter (www.c14.arch.ox.ac.uk/db) and the results are shown below in Figure 4.9. The PCA shows that the Palizzi Rhyolite and the Palizzi fall deposit on Vulcanello are compositionally identical, which confirms what was suspected from the Harker variation diagrams in Figure 4.8.

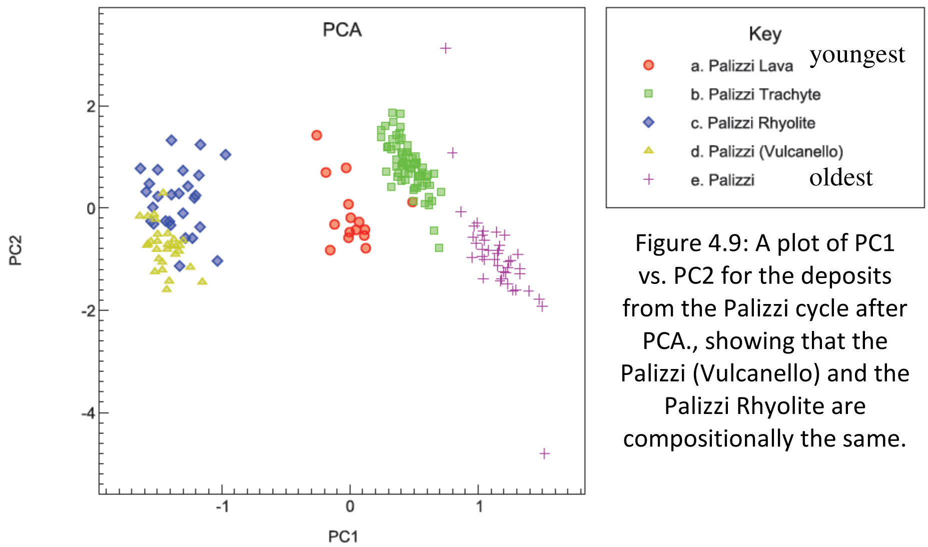



Figure 4.9: A plot of PC1 vs. PC2 for the deposits from the Palizzi cycle after PCA., showing that the Palizzi (Vulcanello) and the Palizzi Rhyolite are compositionally the same.

Mantle normalised trace element data for the Palizzi deposits is characterised by a depletion in Nb, Ta, Zr and Ti relative to the large ion lithophile (LILE) elements. This is typical of island arc magmas and indicative of a subduction setting (Figure 4.10). A slight negative anomaly at Zr is also seen for in the data from all the units.

Negative anomalies in Ba, Sr and Eu are apparent for all the units although they are more subtle for the Palizzi A and Palizzi Trachyte units. The greater degree of fractionation for the

Palizzi Rhyolite deposits indicated by the large negative anomalies at Ba, Sr and Eu also corresponds with higher $SiO_2$. The oldest (Palizzi A) and youngest (Palizzi Trachyte) units have very similar normalised profiles and the Palizzi Rhyolite is more fractionated (i.e. trace element anomalies, higher level of enrichment). This is interpreted as evidence of feldspar fractionation in particular alkali feldspar (Ba, Sr) which occurs on a timescale of 100 years, the difference between the lower and upper units.

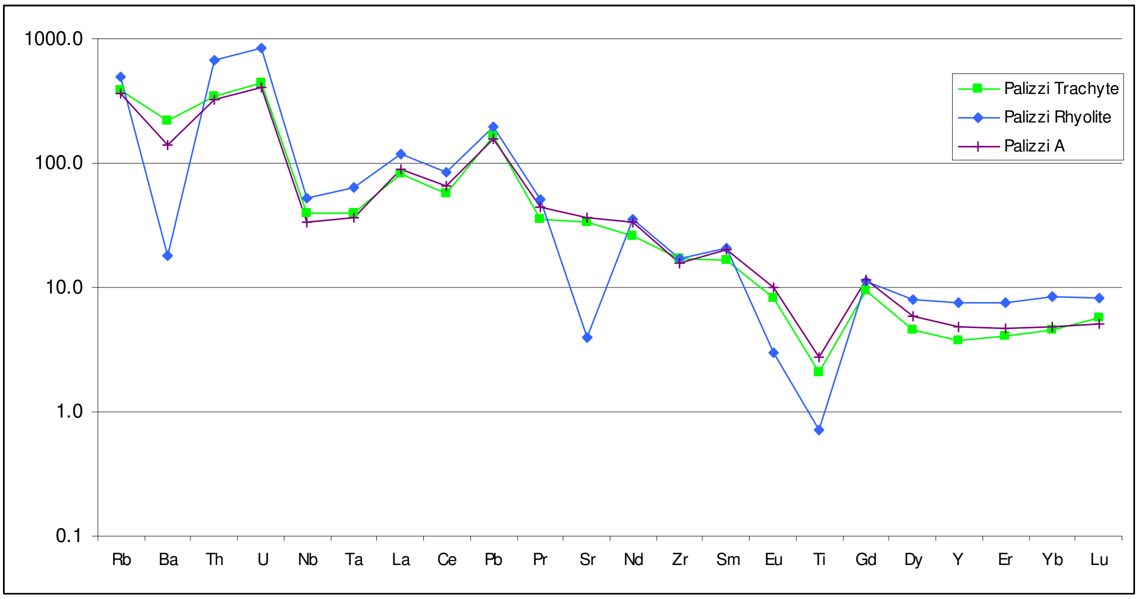



Figure 4.10: Primitive mantle normalised trace element data for "average" Palizzi glass compositions. The island arc signature is characterised by enrichment of LILE relative to the HFSE and the large anomaly at Ti. K-feldspar fractionation is indicated by anomalies at Ba, Sr & Eu.

Trace element variation plots (Figure 4.11) are used to investigate the relationship between the various Palizzi units in more detail. The plots show that incompatible elements such as Rb, La and U display a positive linear correlation when plotted against Nb, reflecting the incompatibility of both elements during fractional crystallisation. Figure 4.11 reiterates the fact that the Palizzi Rhyolite displays a greater degree of plagioclase or K-feldspar removal shown by greater depletion of Sr, Ba and Eu. In all the bi-plots whilst the Palizzi trachyte and Palizzi A overlap the Palizzi rhyolite plots at more evolved compositions. Nb/Zr ratios plotted against Nb confirm that the Palizzi Rhyolite is significantly different to the less evolved deposits of the Palizzi A and Palizzi Trachyte.

The Palizzi A and Palizzi Trachyte deposits display similar degrees of fractionation, with similar concentrations in Sr, Ba, Eu relating to the degree of K-feldspar removal. This means that it is likely that these deposits were from eruptions that were derived from the same magmas, as the incompatible elements such as Nb, U, Pb and Nd all have very similar concentrations. The Palizzi Rhyolite deposits are consequently likely to have been derived from a different batch of magma, indicating that two separately evolved magma systems are coexisting and are active in turn. Since Palizzi Rhyolite is a fall deposit this may indicate that it is derived from a different source to the two other units.

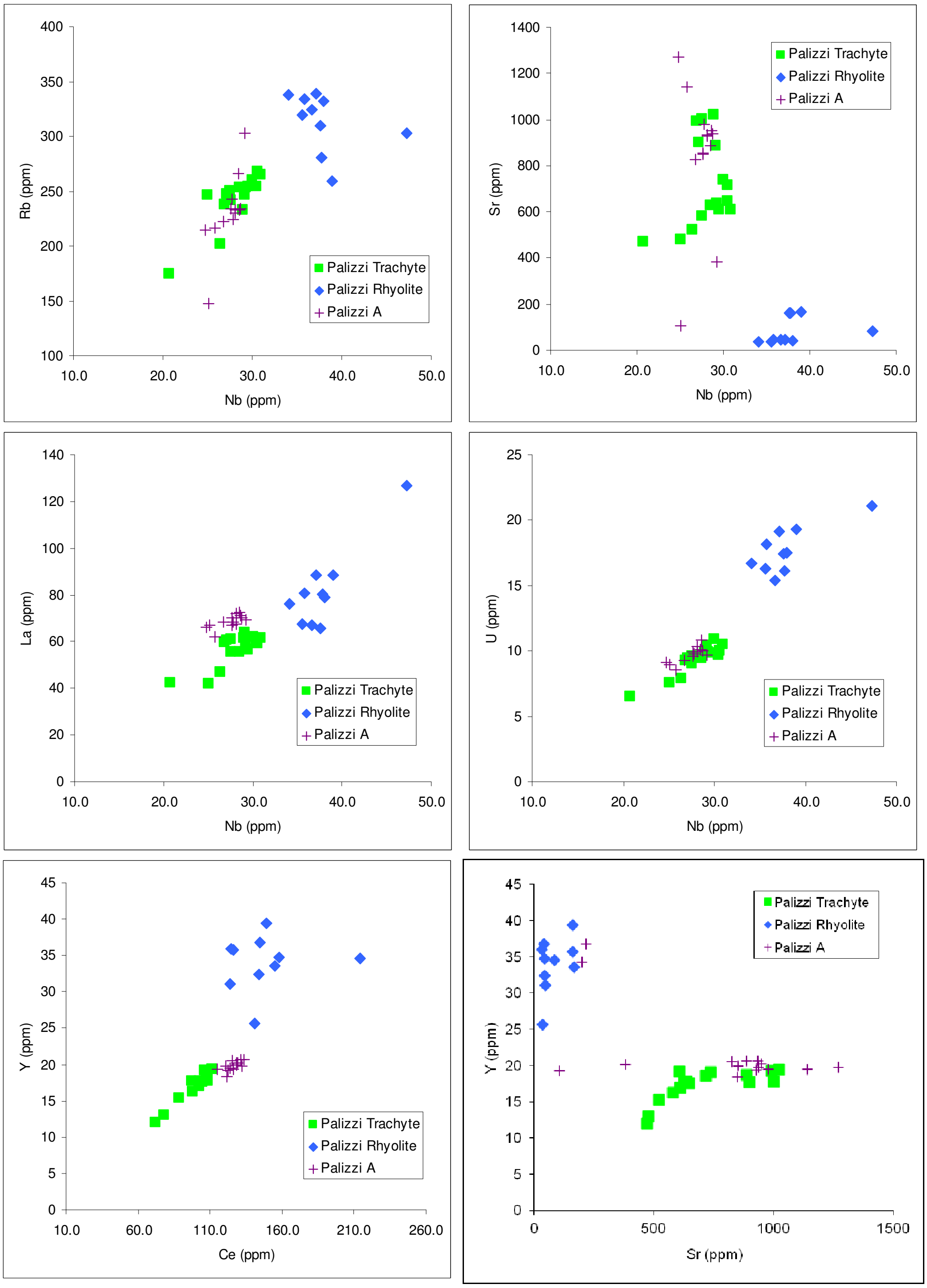



Figure 4.11: Trace element variation plots, including VICE/MICE ratios for the explosive deposits of the Palizzi Cycle

The Commenda Cycle, La Fossa

Juvenile clasts from three different units, from within the Commenda cycle, were analysed using the electron microprobe in Oxford and the results are shown in Figure 4.12. The three units, from oldest to youngest are the Commenda lava, the Commenda Breccia and the Commenda Ash. The Commenda Lava was unusual as it contained very few phenocrysts compared to the other lava flows from La Fossa. The Commenda Breccia is a relatively thin deposit and only a few analyses are available as it was partly altered. The Commenda Ash is a thick, distinctive unit of varicoloured ash made up of very fine ash layers. Only the coarsest layers had shards which were large enough to sample and mount.

Figure 4.12 shows the bimodality of the Commenda units. The older two units (the Lava and the Breccia) are more evolved than the younger Ash unit. Whilst the Commenda Breccia and the Commenda Lava have a similar geochemical composition ($SiO_2$ 72 – 74 wt%), the Commenda Ash is less fractionated and has a very different in composition. It is relatively homogeneous with an average silica composition of ≤60 (wt%). All the other elements have significantly higher concentrations than that are found in the Breccia or Lava.

Generally, it is fair to say that although the Commenda Cycle is temporally different from the Palizzi Cycle, as the cycle begins with products that are more evolved than the younger ones, the magmatic variability seen within the Palizzi Cycle is similar to that of the Commenda Cycle. However the more evolved units (the Commenda Lava and Commenda Breccia) have a very similar composition to the Palizzi Rhyolite and the Commenda Ash generally has a similar composition to that of the Palizzi Trachyte unit. The two slight exceptions to this can be seen in the $Na_2O$ and $K_2O$ plots, where the more evolved Commenda deposits have greater variability. The high $K_2O$ values within the Commenda Breccia deposit may be due to alteration.

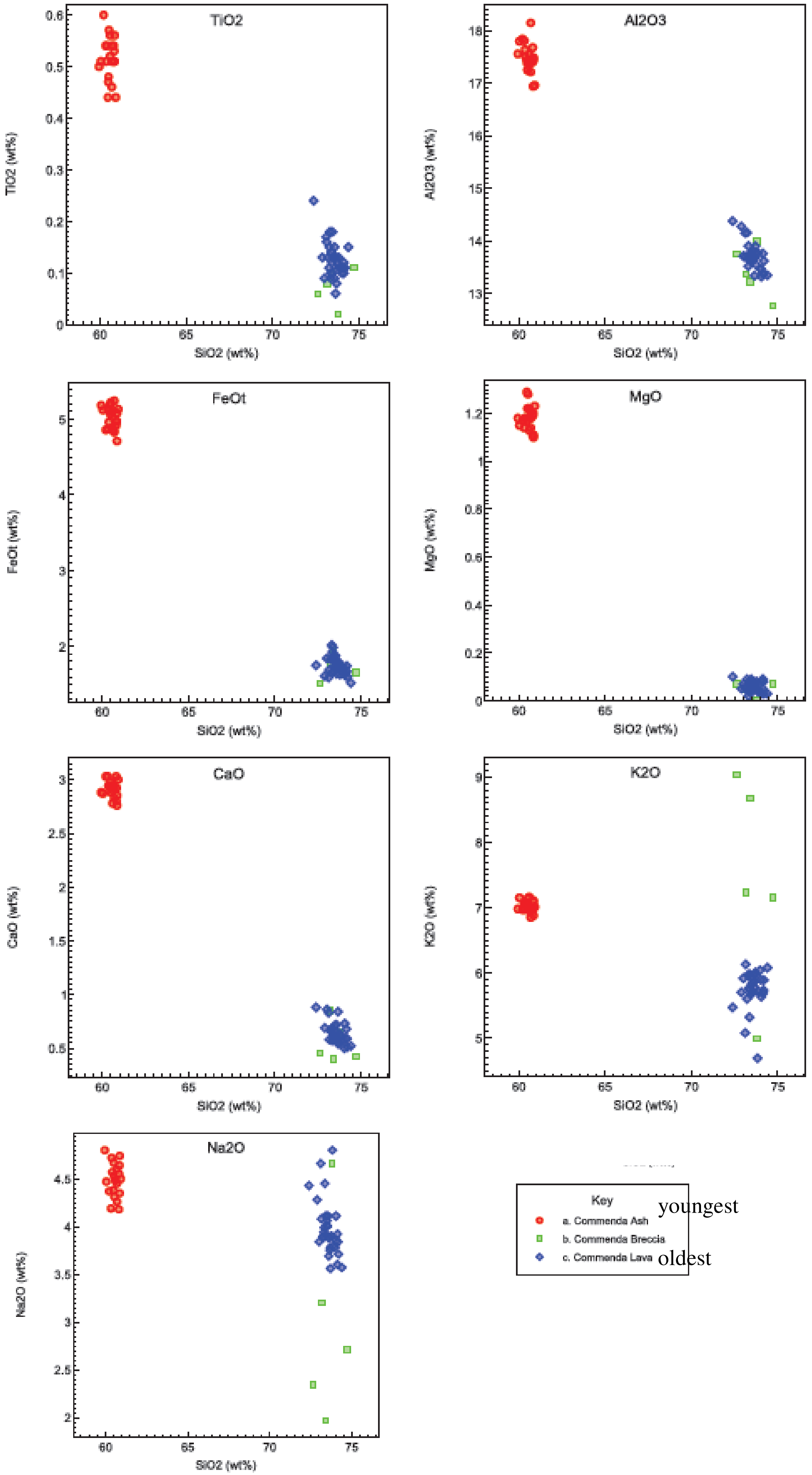



Figure 4.12: Silica variation diagrams for selected major elements. All data points displayed are normalised to 100 wt%. In the key the samples are in approximate chronostratigraphic order.

Figure 4.13 shows mantle normalised trace element data for the oldest Commenda lava, and the youngest being Commenda Ash. The Commenda Breccia was not analysed as it was not possible to find large enough areas of suitable glass. As with the other glasses the HFSE elements (Nb, Ta, Zr, Ti) depletion the relative enrichment of the LIL elements (Rb, Pb) is apparent and indicative of an island arc signature. The older Commenda lava is more fractionated than the overlying Commenda ash

Again fractionation of K-feldspar has resulted in negative anomalies in Ba, Sr and Eu. The contrast in the trace element profiles show that the Commenda Lava and the Commenda Ash are most likely from either different magma sources or a geochemically layered magma chamber as they have markedly different geochemistry and have undergone different degrees of fractional crystallisation. The time difference between the start and end of the Commenda Cycle is thought to be about 100 years.

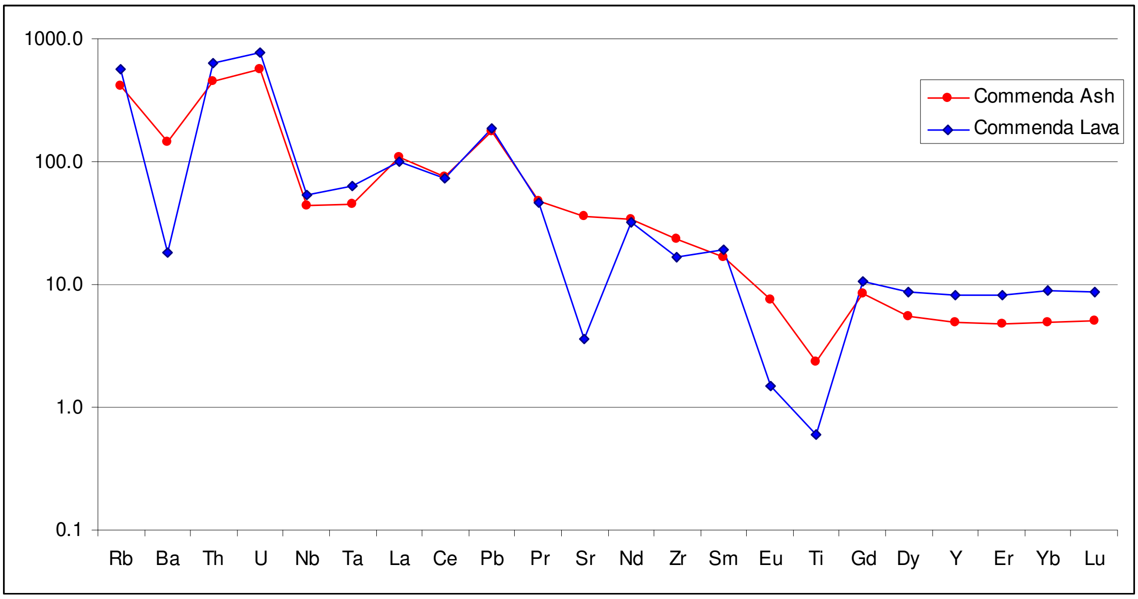



Figure 4.13: Mantle normalised trace element data for "average" glass compositions from the Commenda Cycle. Deep processes (i.e., island Arc signature) are characterised by the depletion in HFSE and shallow processes by the anomalies at Ba, Sr & Eu (i.e., K-feldspar fractionation)

Figure 4.14 uses trace element bi-plots to explore the differences between the Commenda units

The plot of Sr vs. Nb also shows that as the amount of Nb increases the amount of Sr decreases as a consequence of plagioclase or K-feldspar fractionation. When the elements of La and Nb are compared, it is possible to see that in contrast to the samples from the

Palizzi Cycle, despite being an incompatible element, the concentration of La decreases as Nb increases rather than having a positive correlation similar to other incompatible elements. The plot of Nb/Zr ratios against Nb shows that the two Commenda units are significantly different to each other, which is confirmed by the plot of Ce vs. Y. This bi-plot shows that whilst the two samples have a similar range in concentration of Ce, the concentration of Y is significantly lower for the Commenda Ash which indicates that the two samples were erupted from two magma chambers which have undergone different amounts of fractionation. However, it is also possible that the variation may be due to tapping different parts of a large layered magma chamber.

All of the various bi-plots shown in Figure 4.14 confirm that the Commenda Ash and Commenda Lava are likely to have been erupted from different magma batches.

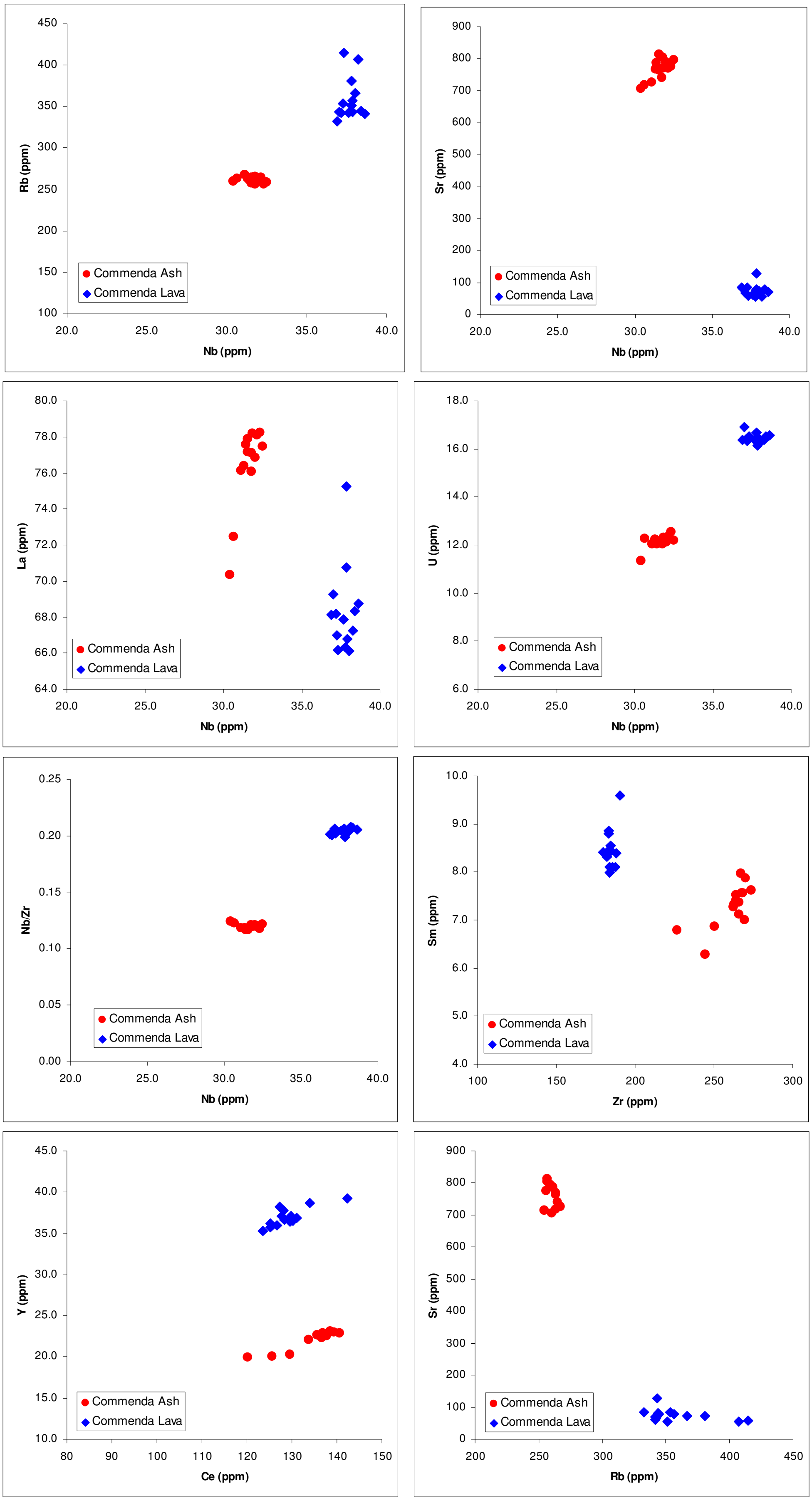



Figure 4.14: Trace element variation plots, including VICE/MICE ratios for the explosive deposits of the Commenda Cycle

The trace element profiles (Figs 4.13 & 4.14) reveal that the Commenda Lava (fractionated) and the Commenda Ash (less fractionated) are from magmas that have undergone different degrees of fractional crystallisation. Fractional crystallisation increases the concentration of incompatible elements (e.g.: Nb, La & Zr) found in the melt as these elements do not crystallise into any of the forming minerals. Interestingly the Commenda deposits have similarities to the Palizzi cycle. The effusive products, the Commenda lava and the Palizzi Rhyolite, have chemical similarities as do the explosive products, the Commenda Ash and the Palizzi Trachyte and the Palizzi A unit. Like the Palizzi cycle, the Commenda eruptive cycle lasted 100 years but within that cycle, fractionated magmas were erupted first followed by a less fractionated magma (either as effusive or explosive deposits) which would require either different batches of melt, or rapid replenishment and fractionation.

1888-90 Eruption and the Pietre Cotte Cycle, La Fossa

The most recent deposit from the 1888-90 eruption of La Fossa has been included with the Pietre Cotte even though there is still some debate in the literature whether this eruption is part of the Pietre Cotte cycle or not.

EMP analysis of juvenile glass clasts from five different units from within the 1888-90 and Pietre Cotte cycle are compared in Figure 4.15. From oldest to youngest they are as follows: the Lower Pietre Cotte explosive deposits; the Pietre Cotte lava flow which divides the Upper and Lower Pietre Cotte explosive units; a mingled pumice from the Upper Pietre Cotte; the Upper Pietre Cotte explosive deposits and finally the deposits from the 1888-90 eruption. Successful laser ablation analysis was carried out on the explosive deposits (from oldest to youngest) of the Lower Pietre Cotte, the Upper Pietre Cotte and on the deposits from the 1889-90 eruption

Similar to the Palizzi Cycle, the deposits from the Pietre Cotte Cycle and 1888-90 Eruption show compositional diversity as well as temporal cyclicity. The general geochemical trends exhibited by the deposits can be seen in the Harker variation diagrams shown in Figure 4.15. For example, from the Ca vs. Si diagram, it is possible to see that the cycle started with an explosive eruption of the Lower Pietre Cotte (LPC) which predominantly consisted of the least evolved magma, with a $SiO_2$ concentration of ca. 58 (wt%) and a small amount of more fractionated, higher $SiO_2$ magma. The less evolved magma has a similar composition to the

Commenda Ash (the youngest deposits from the previous cycle). Following the LPC, was an effusive deposit, the Pietre Cotte Lava which was predominantly an obsidian lava flow. This lava flow consists of the most fractionated magma of the Pietre Cotte Cycle and has an average silica content of about 74 % which is the same as the more evolved deposits from the older cycles.

The MgO vs. $SiO_2$ diagram shows that as expected the mingled Pietre Cotte pumice has a diverse composition ranging from 59 % ($SIO_2$) up to 73 % ($SiO_2$), which means that the mingling may be from two co-existing magmas. The Upper Pietre Cotte (UPC) deposits are younger than the mingled Pietre Cotte pumices and have a composition very similar to the less evolved LPC. Both the Lower and Upper Pietre Cotte explosive deposits have a strong negative correlation between MgO & $SiO_2$ and CaO & $SiO_2$ which is indicative that feldspar (pyroxene) fractionation is occurring. Finally the youngest deposits from the 1888-90 eruption are more evolved than the preceding UPC and have a range of intermediate magma compositions. As with the Palizzi Cycle, the Pietre Cotte Cycle clearly shows magmatic cyclicity and that there is either more than magma chamber beneath La Fossa or a magma chamber that is compositionally layered.

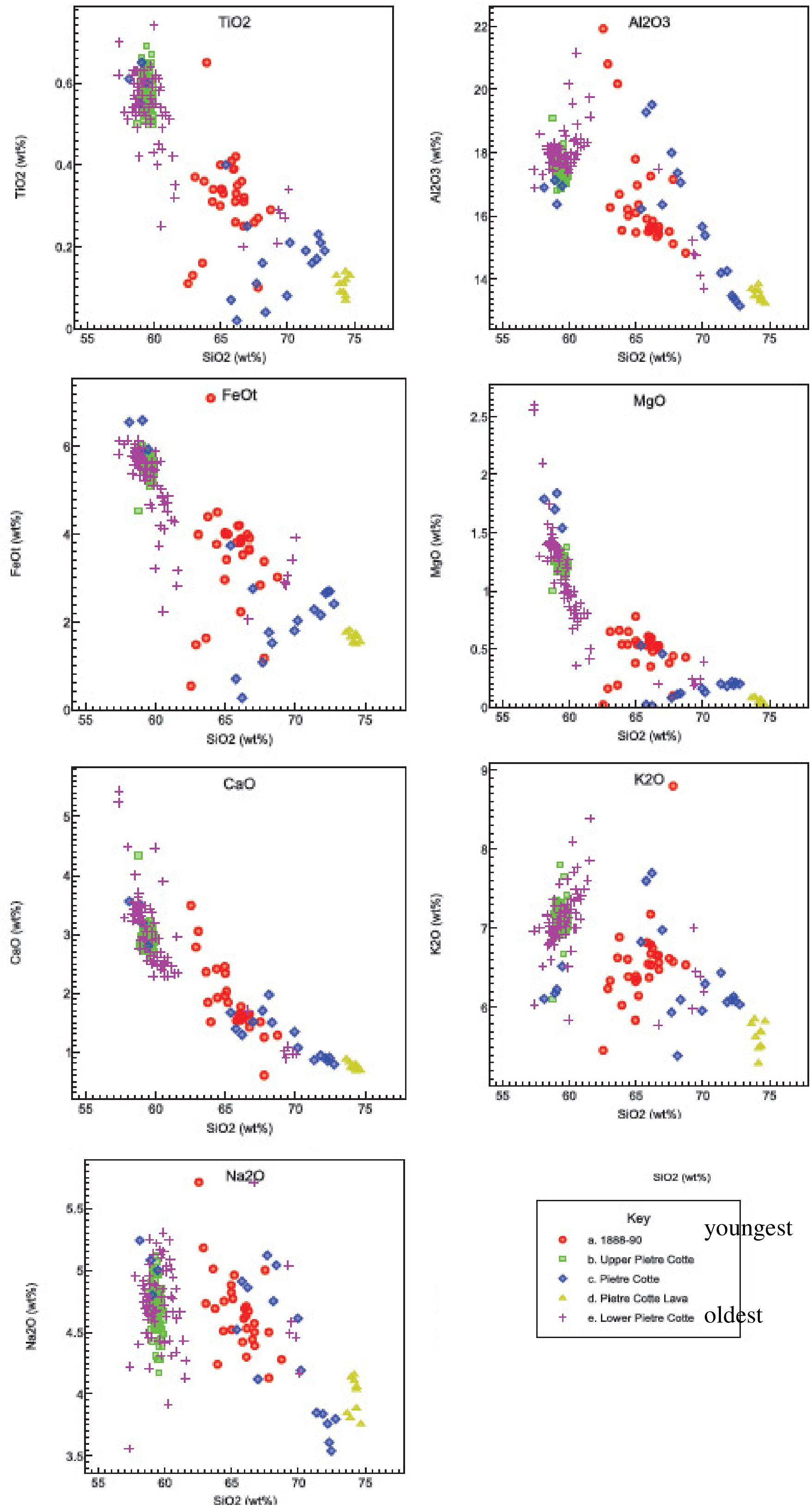
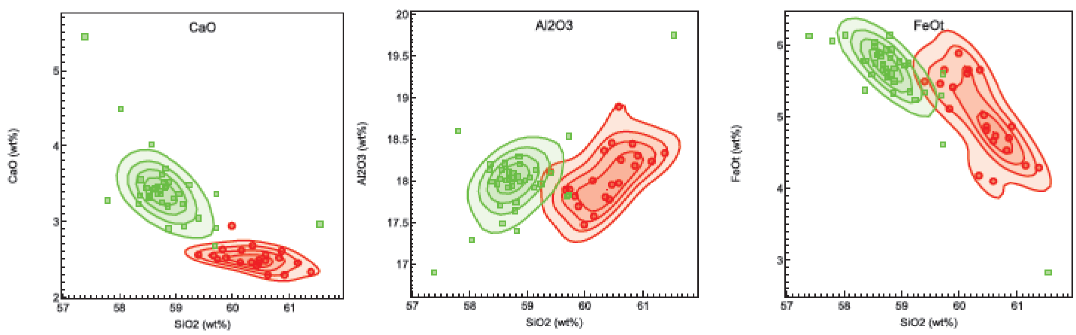



Figure 4.15: Harker variation plots for selected major elements. All data points displayed are normalised to 100 wt%. In the key the samples are in approximate chronostratigraphic order.

Samples were collected from the base and top of the LPC and from the base, middle and top of the UPC unit. Figure 4.15 shows these samples combined into the 'Lower Pietre Cotte' and the 'Upper Pietre Cotte'. Whereas there was no variation within the UPC unit, the top and bottom halves of the LPC show significant differences. Figure 4.16 shows selected Harker variation diagrams (Ca, Al and Fe) for the two sub-units of the LPC. There is a slight increase in silica fractionation with the older part of this unit (LPC1) being less evolved (Si: 58 – 59 wt%) than the upper part (LPC2) (Si: 60 – 61 wt%). This may be due to slight variations within the magma chamber and the eruption tapping different parts of the magma chamber during the eruption.



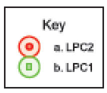




Figure 4.16: Selected Harker variation diagrams illustrating the variability between the top (LPC2) and bottom (LPC1) halves of the Lower Pietre Cotte explosive deposit. The contours show the Kernel Density Estimation (KDE) of a data point belonging to the sub-unit.

Mantle normalised trace element data for the most recent La Fossa cycle are also indicative of a subduction setting and show diagnostic island arc features (Figure 4.17). The large ion lithophile (LILE) elements including Rb and Pb are enriched relative to the high field strength (HFSE) elements of Nb, Ta and Zr. The typical island arc trough-like feature of Nb & Ta is not that obvious, which means that the large negative anomaly at Ti for the Lower Pietre Cotte, is possibly due to other processes such as magnetite fractionation occurring in this sample. A slight negative anomaly at Zr is also seen for in the data from all three units.

K-feldspar fractionation appears to increase through time as seen in the overall trace element profile in Figure 4.17. The figure shows slight negative anomalies in Ba, Sr and Eu for the Lower Pietre Cotte unit, increasing to significant negative anomalies for the 1888-90 eruption. The greater degree of fractionation throughout this cycle also corresponds with increasingly high $SiO_2$ values found through EMPA analysis.

With the exception for Ti, the general similarity in the trace element profiles show that the Lower Pietre Cotte and the Upper Pietre Cotte deposits are from possibly the same source as they are geochemically similar although they also reflect slight differences in degrees of fractional crystallisation, whereas the younger deposit from the 1888-90 eruption reveals much stronger fractional crystallisation. From EMP analysis, the amount of Ti in both the LPC and UPC is similar, which does not match with the LA-ICP-MS results. It is possible that this is because fewer successful laser analyses of the LPC were carried out (12 compared to 22 for the UPC) and so any geochemically anomalous spots were enhanced. The time difference between the Lower and Upper Pietre Cotte eruptive episodes is possibly as little as 50 years with a 350 years gap between UPC & 1888-90 eruption (see Chapter 3 for further details).

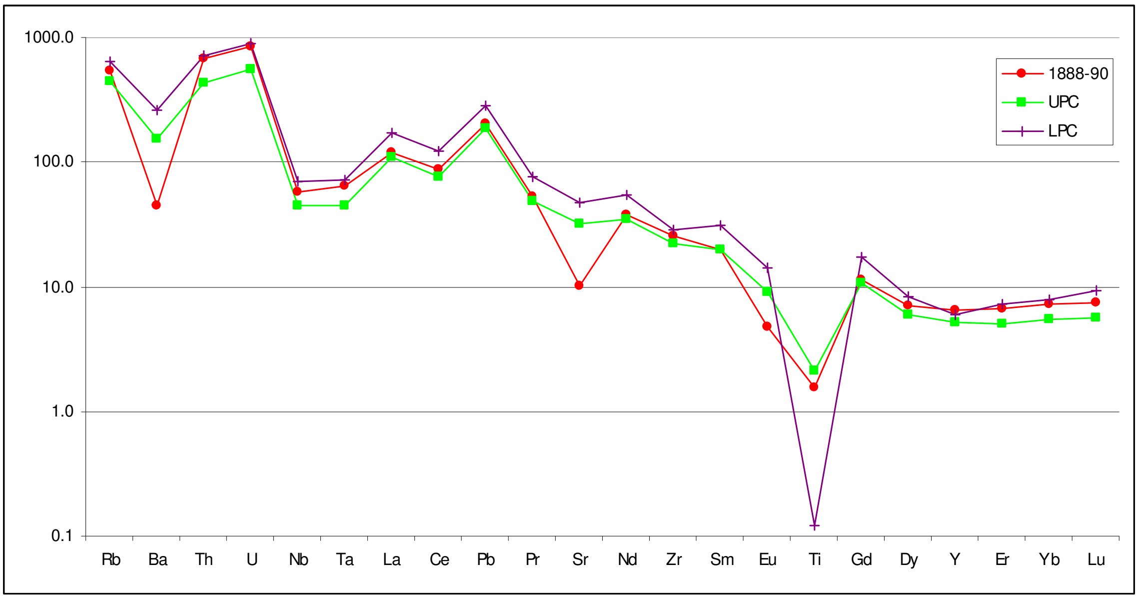



Figure 4.17: Mantle normalised trace element "averages" for glass compositions from the two Pietre Cotte units and the 1888-90 deposit. Island Arc signature is characterised by enrichment of LILE relative to the HFSE and the large anomaly at Ti. K-feldspar fractionation is indicated by anomalies at Ba, Sr & Eu.

It was only possible to distinguish between the Lower and Upper Pietre Cotte units through their stratigraphic position as their major element geochemistry was very similar. This means that trace element ratio plots (Figure 4.18) have been used to investigate the geochemical relationship between the various Pietre Cotte units in more detail. The bi-plots of Rb vs. Nb, La vs. Nb and U vs. Nb all display a positive linear correlation reflecting the incompatibility of both elements during fractional crystallisation. A similar positive linear correlation can be seen in the plot of Nb/Zr vs. Nb. All these plots show that the three units are significantly different from each other.

Figure 4.18 shows that there appears to be a similar negative linear correlation to the relationship between Sr and Nb as is seen in the deposits from the older cycles of La Fossa. However, in the case of the Pietre Cotte Cycle, the deposits from the Lower Pietre Cotte appear to lie off this correlation. They have significantly higher concentrations of Sr, as well as Ba and Eu. This means that K-feldspar has not been removed from the melt and that the degree of fractionation crystallisation is different to the other units in the cycle.

VICE/MICE ratios also demonstrate the ease with which it possible to distinguish the Lower Pietre Cotte deposits from those of the Upper Pietre Cotte or 1888-90 eruptions.

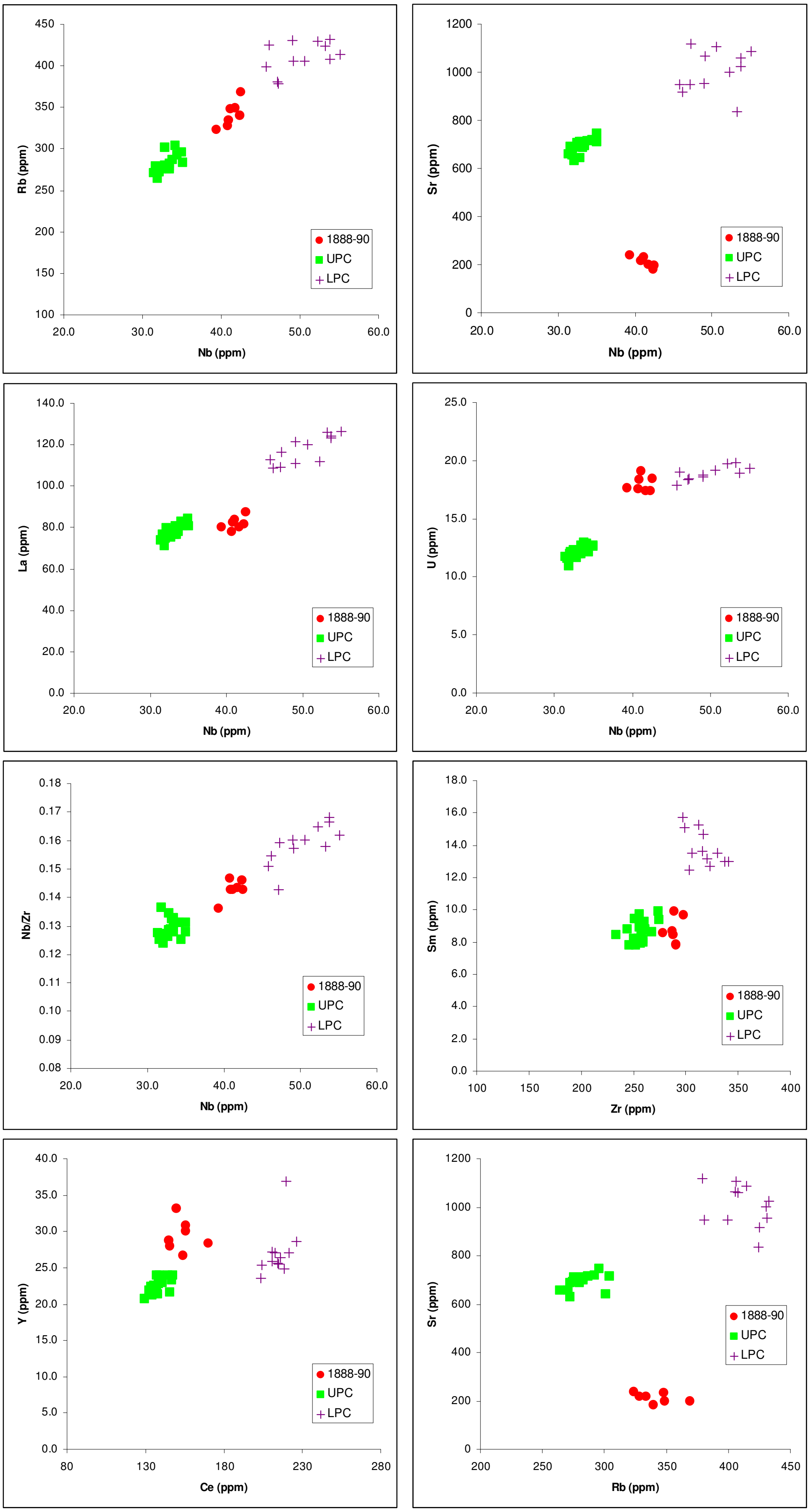



Figure 4.18: Trace element variation plots, including VICE/MICE ratios for the explosive deposits of the most recent cycle from La Fossa

Vulcanello

Five samples from throughout the Vulcanello I deposits were collected along with a sample from Vulcanello II (known as the 'Golden Tephra' layer) as well as from the Vulcanello Lava Platform. Two samples were collected from the Roveto Lava flow and a further sample was taken from the youngest of the Vulcanello deposits, Vulcanello III. All the samples were analysed using the electron microprobe in Oxford.

However, it was not possible to analyse all 10 samples by laser ablation as the effusive deposits lacked the crystal-free glass needed for successful analysis. Of the five samples collected from the Vulcanello I deposit, only three of them were used for trace element analysis – the base (AT4), the middle layer (AT6) and the top (AT8). For ease of understanding, in the diagrams these three samples are referred to as Vulcanello 1a (AT4), Vulcanello Ib (AT6) and Vulcanello Ic (AT8). The sample from Vulcanello II ('Golden Tephra' layer) as well as the sample taken from the youngest of the Vulcanello deposits, Vulcanello III were also analysed using LA-ICP-MS.

Harker variation diagrams for glass clasts from Vulcanello I (Figure 4.19) reveal a clustering of data. The average silica composition for Vulcanello I is 55.0 (wt%) with a range from ca. 53 - 57.wt%). The successful data points produced by analysing the glass found in the Lava Platform show a much more evolved composition than the explosive deposits and have an average silica concentration of ~65 (wt%). The average $SiO_2$ composition for Vulcanello II is also 55.0 (wt%) but with a slightly narrower range of ~53.7 to ~56.3 (wt% than Vulcanello I). Harker variation diagrams especially Mg vs. Si and Ca vs. Si highlight the fact that the Vulcanello I have a greater range in Mg and Ca than Vulcanello II

The effusive Roveto lava flow and explosive Vulcanello III eruption occurred approximately 350 years after the previous eruptions of Vulcanello. The Roveto lava flow has previously been classified as one unit (Davi et al, 2009) but recent work (Rosi, pers comm. 2009) proposes that there are several different flows. Glass data is available from the younger, upper Roveto flow as the older flow had too many microcrysts. The glass analysis from the Roveto lava flow (Fig 4.20) is compositionally similar to the explosive deposits of Vulcanello I and II, with silica values with an average value of ~56 (wt%). The samples have a low concentration of Al and Ca, and a high concentration of Ti, Fe, Mg and K. The juvenile glass clasts from Vulcanello III are also relatively homogenous (Fig 4.20) and slightly more evolved with $SiO_2$ values for the Vulcanello III deposits ranging from ~60 to ~62 (wt%).

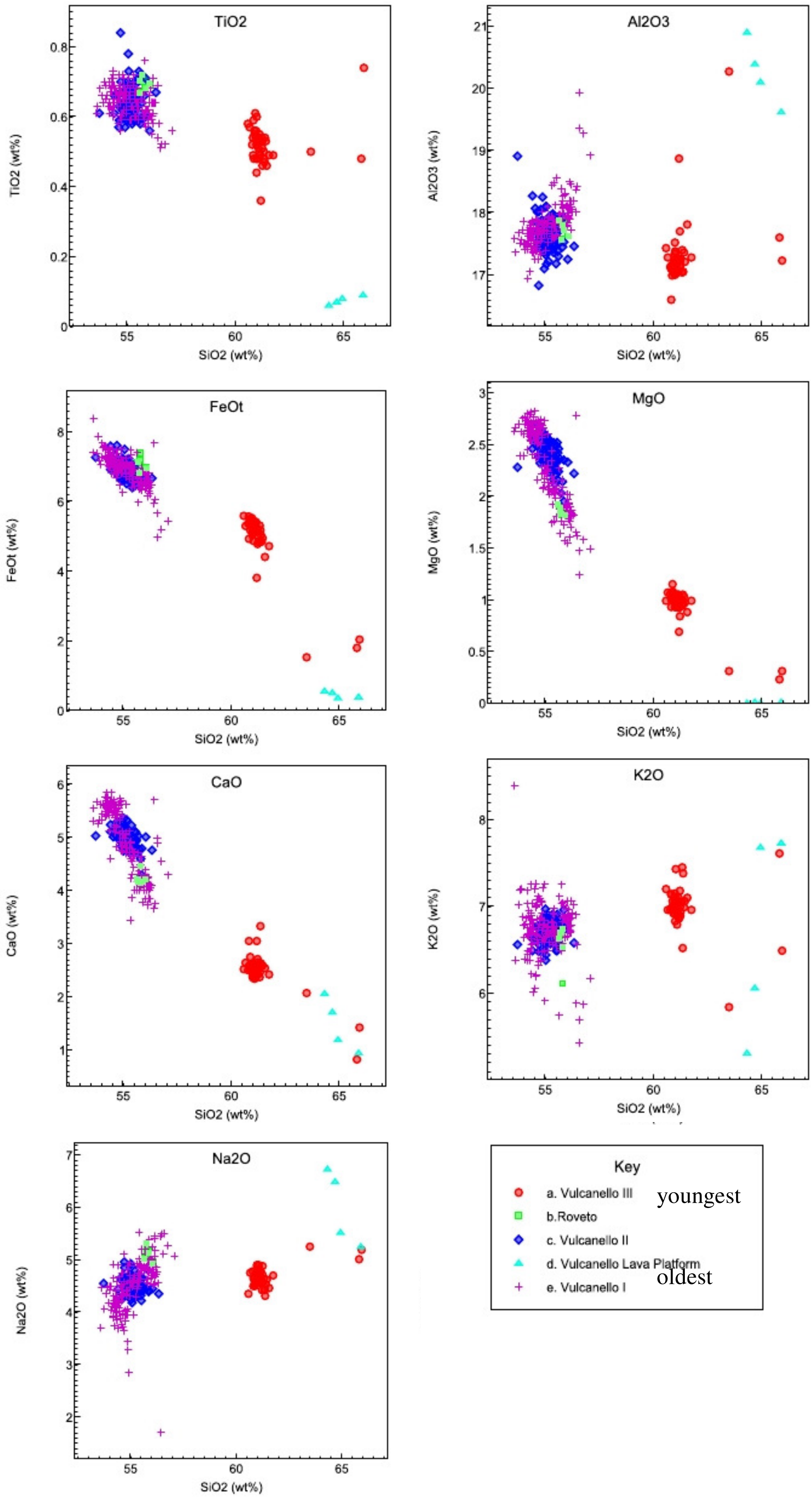



Figure 4.19: Harker variation plots for selected major elements. All data points displayed are normalised to 100 wt%. The Key included within the diagram gives details on the different units erupted from Vulcanello

Mantle normalised trace element data for the Vulcanello deposits show enrichment in the large ion lithophile (LILE) elements (Rb and Pb) relative to the high field strength (HFSE) elements (Nb, Ta and Zr). The large negative anomalies at Nb, Ta and Zr are indicative of an island arc signature (Figure 4.20). The more evolved deposits of Vulcanello III have pronounced negative anomalies in Ba, Sr and Eu due to feldspar fractionation. The overall similarity between the trace element profiles show that the explosive deposits from Vulcanello are geochemically very similar and that they reflect slight variations in the degree of fractional crystallisation.

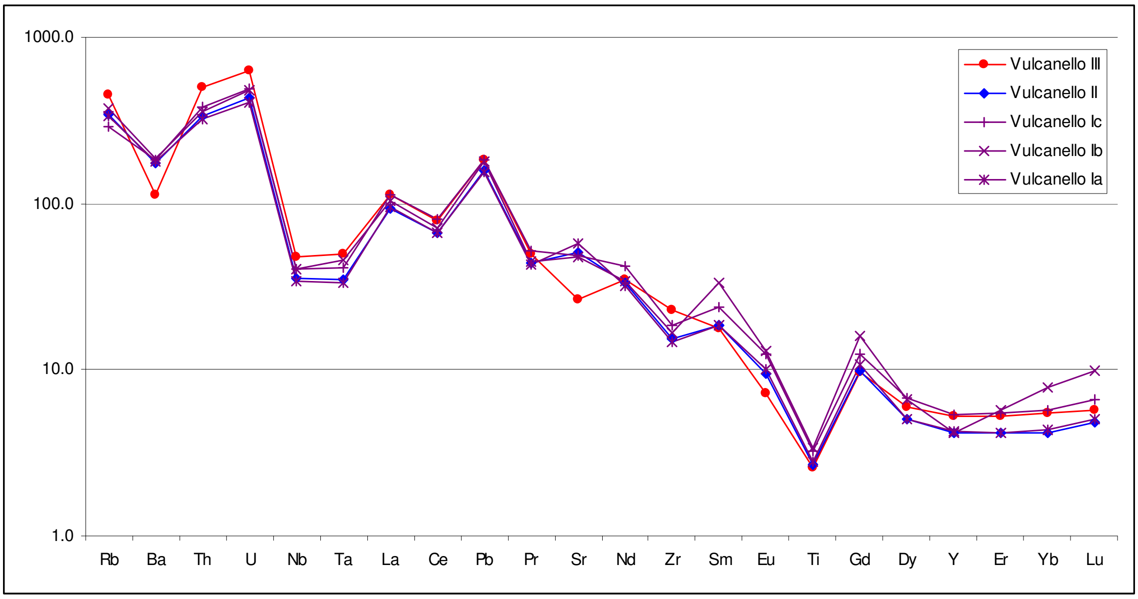



Figure 4.20: Mantle normalised trace element data for "average" glass compositions from the explosive Vulcanello units. Island Arc signature is characterised by enrichment of LILE relative to the HFSE and the large anomaly at Ti. K-feldspar fractionation is indicated by anomalies at Ba, Sr & Eu.

The incompatible elements of Rb, La and U all display a positive linear correlation with Nb which implies that the increase in the concentration of incompatible elements is a consequence of a greater degree of fractionation (Figure 4.21). Nb was also used as an index of fractionation for the plot comparing it to Sr. This plot shows a negative linear correlation meaning that as Nb increases, Sr decreases and is probably reflecting plagioclase or K-feldspar fractionation. Using Nb as an index of fractionation (Figure 4.21), it is apparent that the eruption cycles of Vulcanello I, became more evolved with time.

The deposits from the Vulcanello II eruption have lower concentrations of Nb, Rb, La and U than the upper part of the Vulcanello I deposit, showing that it is likely that fresh magma was involved in the eruption and the it is not the case that fractional crystallisation is simply occurring. The youngest deposit, Vulcanello III, is the most fractionated of all the Vulcanello deposits which is similar to the evidence from the major element analysis. Figure 4.21 also shows that within the Vulcanello I samples, the middle of the unit, Vulcanello Ib (AT6), has a higher concentration of Sm than the lower older and younger parts of the eruption, although this is probably due to the analytical methods used to collect the data.

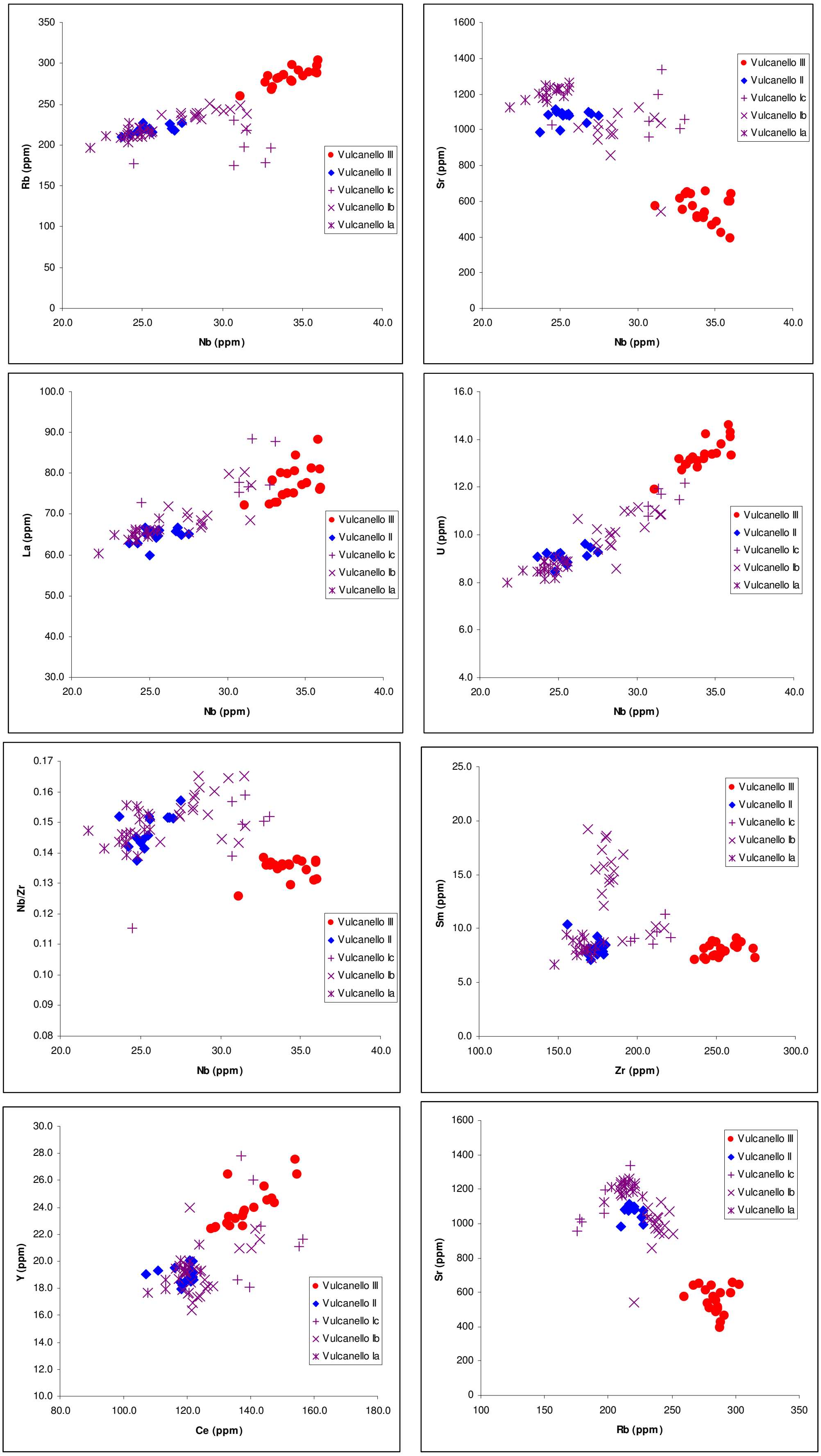



Figure 4.21: Trace element variation plots, including VICE/MICE ratios for the explosive deposits from Vulcanello

Comparison of the contemporaneous eruptions at La Fossa and Vulcanello

The La Fossa cone erupts more frequently than Vulcanello and has more magmatic diversity in the erupted deposits, but when Vulcanello does erupt, it produces products with a similar magmatic composition. For example at the beginning of the Palizzi Cycle on La Fossa, low silica magmas were also erupted from Vulcanello I.

Although the exact temporal relationship between these deposits requires more detailed investigation, Figure 4.22 shows the mantle normalised trace element data for the Palizzi A unit from La Fossa and the three units from the Vulcanello I eruption. It is clear from the similarity in the trace element profiles that the Palizzi A and the Vulcanello I deposits are from the same source as they are geochemically very similar with similar degrees of fractional crystallisation. More specifically, it is possible to see that the Palizzi A deposits are most like those from the older part of the Vulcanello I eruption (Vulcanello Ia (AT4) and Ib (AT6)).

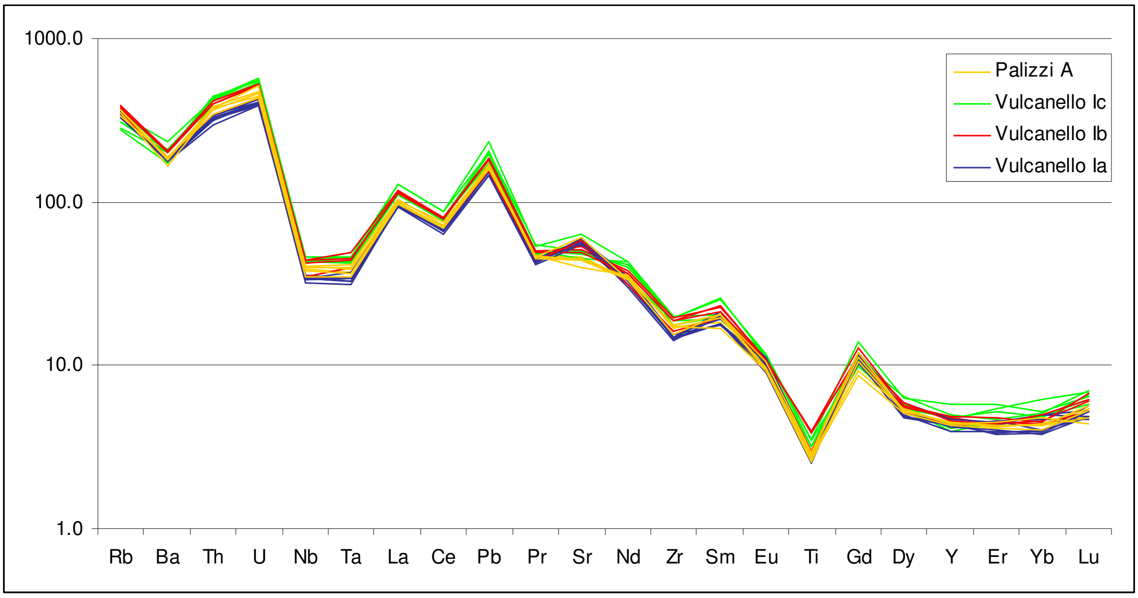



Figure 4.22: Primitive mantle normalised trace element data from the Palizzi A and Vulcanello I units. Island Arc signature is characterised by enrichment of LILE relative to the HFSE and the large anomaly at Ti.

From Figure 4.23 it is possible to see that the Palizzi A sample plots within the range of the Vulcanello I deposits and is generally, with the exception of the concentration of Sm (the variation is probably just analytical), is geochemically most similar to the middle part of the Vulcanello I unit, known as Vulcanello Ib (AT6).

Nb/Zr ratios plotted against Nb show no significant difference between the Palizzi A and Vulcanello I samples. However the plot of Zr vs. Sm displays a slight positive correlation between the Palizzi A, Vulcanello Ia (AT4) and Vulcanello Ic (AT8) samples, although the Vulcanello Ib samples lie slightly off this trend, although this variation may be due to the analytical processes.

The Palizzi A and Vulcanello I deposits display similar degrees of fractionation as they have similar concentrations in Sr, Ba, Eu relating to the degree of K-feldspar and plagioclase removal. This means that it is likely that these eruptions have been derived from the same magma batch. Also, the incompatible elements of Nb, U and Rb all have near identical geochemical concentrations. It has not been possible to determine any diagnostic features that significantly geochemically separate the Palizzi A and Vulcanello I samples.

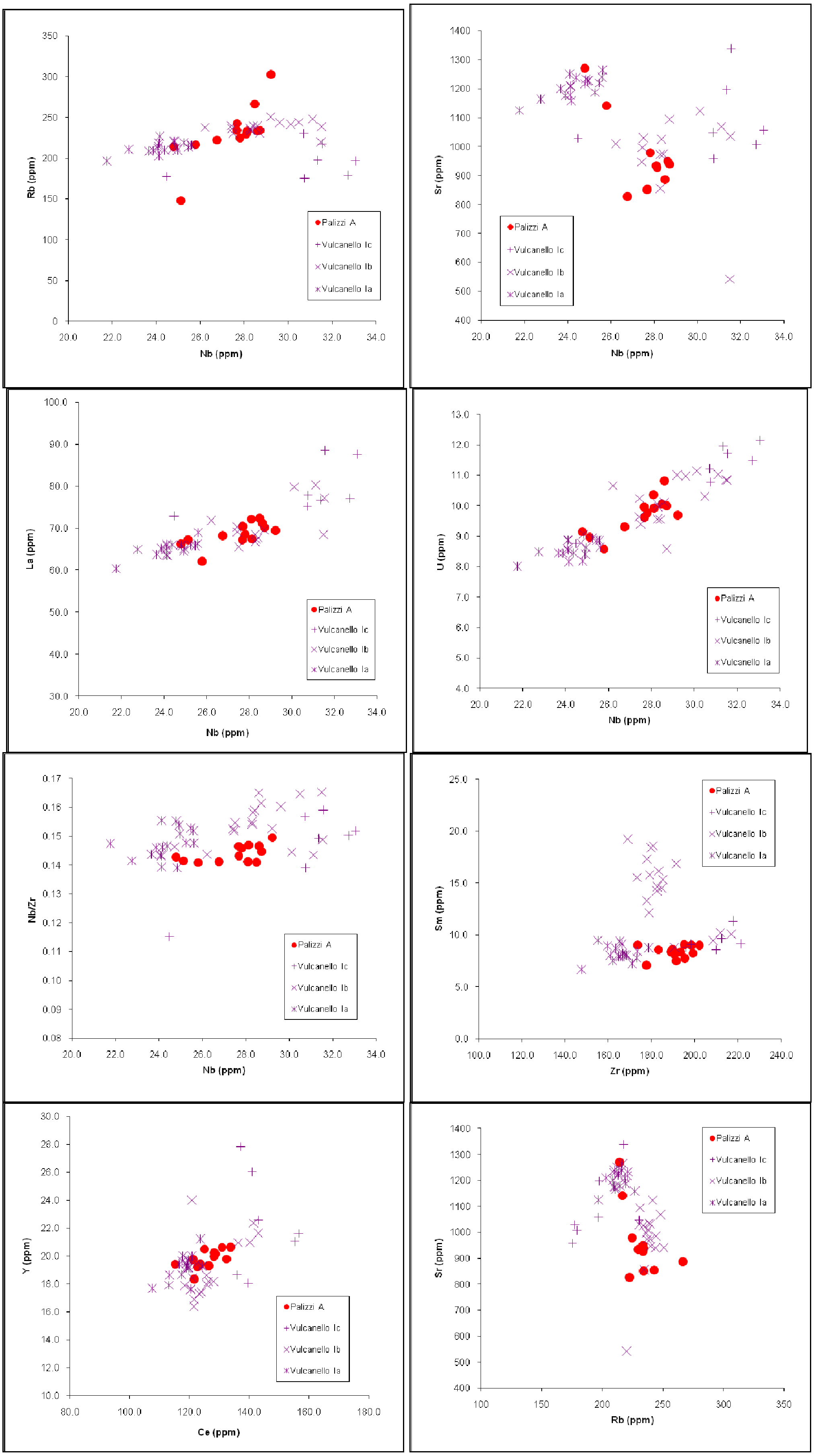



Figure 4.23: Trace element variation plots, including VICE/MICE ratios for the explosive deposits of the Palizzi A and Vulcanello I deposits

A similar comparison can be made of the deposits erupted during more recent eruptions of Vulcanello and those of the Upper Pietre Cotte from La Fossa. Trenches dug on Vulcanello show that there are at least two deposits of Vulcanello III, the lower of which separates the Lower and Upper Pietre Cotte deposits and an upper one above the Upper Pietre Cotte unit. Even though the exact temporal relationship between these deposits requires more detailed investigation, the relationship of their trace element geochemistry is shown in Figures 4.24 and 4.25. It is clear from the similarity in the trace element profiles shown in Figure 4.24, that the Upper Pietre Cotte and the Vulcanello III deposits are from the same magma batch as they are geochemically very similar and also reflect very similar degrees of fractional crystallisation.

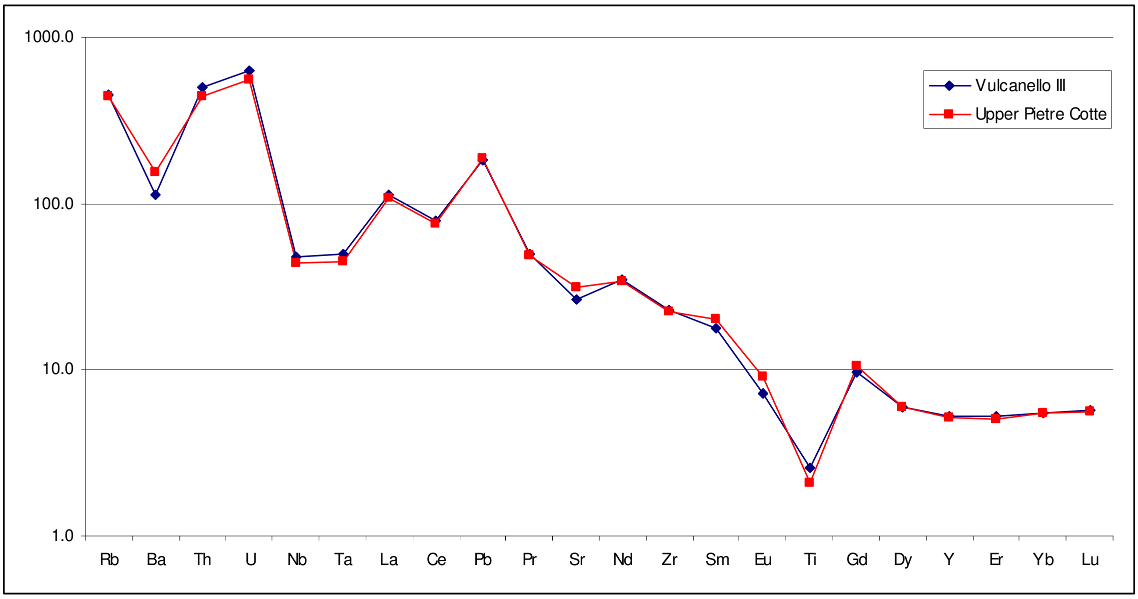



Figure 4.24: Mantle normalised trace element data for "average" glasses from the Upper Pietre Cotte and Vulcanello III units. Island Arc signature is characterised by enrichment of LILE relative to the HFSE and Ti. K-feldspar fractionation is indicated by anomalies at Ba, Sr & Eu.

Trace element ratio plots (Figure 4.24) have been used to investigate the relationship between the contemporaneous eruptions of Upper Pietre Cotte and Vulcanello III units in more detail. From the diagram it is possible to see that the generally the Upper Pietre Cotte sample overlaps with the Vulcanello I deposits. The diagram shows that the trace element biplot for Rb vs. Nb indicates that there is a positive linear correlation between the elements with the increase in the concentration of incompatible elements resulting from an increase in the degree of fractionation.

Figure 4.25 also shows that the Vulcanello III deposits, display a greater degree of K-feldspar removal from the melt, indicated by greater depletion of Sr as well as Ba and Eu (not shown in the diagram). The linear correlation seen for the Vulcanello III sample is indicative of feldspar fractionation. The plots of La vs. Nb and U vs. Nb both display a positive linear correlation reflecting the incompatibility of both elements during fractional crystallisation. Nb/Zr ratios plotted against Nb show no significant difference between the Upper Pietre Cotte and Vulcanello III samples, nor does the plot of Zr vs. Sm. However, the plot of Ce vs. Y shows that within each of the deposits there is a positive correlation which reflects the similarity of the incompatibility within their mineral phases.

The Upper Pietre Cotte and Vulcanello III deposits display slightly different degrees of fractionation, with variation in the concentrations in Sr and Ba relating to the degree of K-feldspar removal. It is likely that these eruptions have been derived from the same source melts, as incompatible elements, Nb, U, Pb and Nd are all of identical concentrations. It has not been possible to determine any diagnostic features that significantly geochemically separate the Upper Pietre Cotte and Vulcanello III samples.

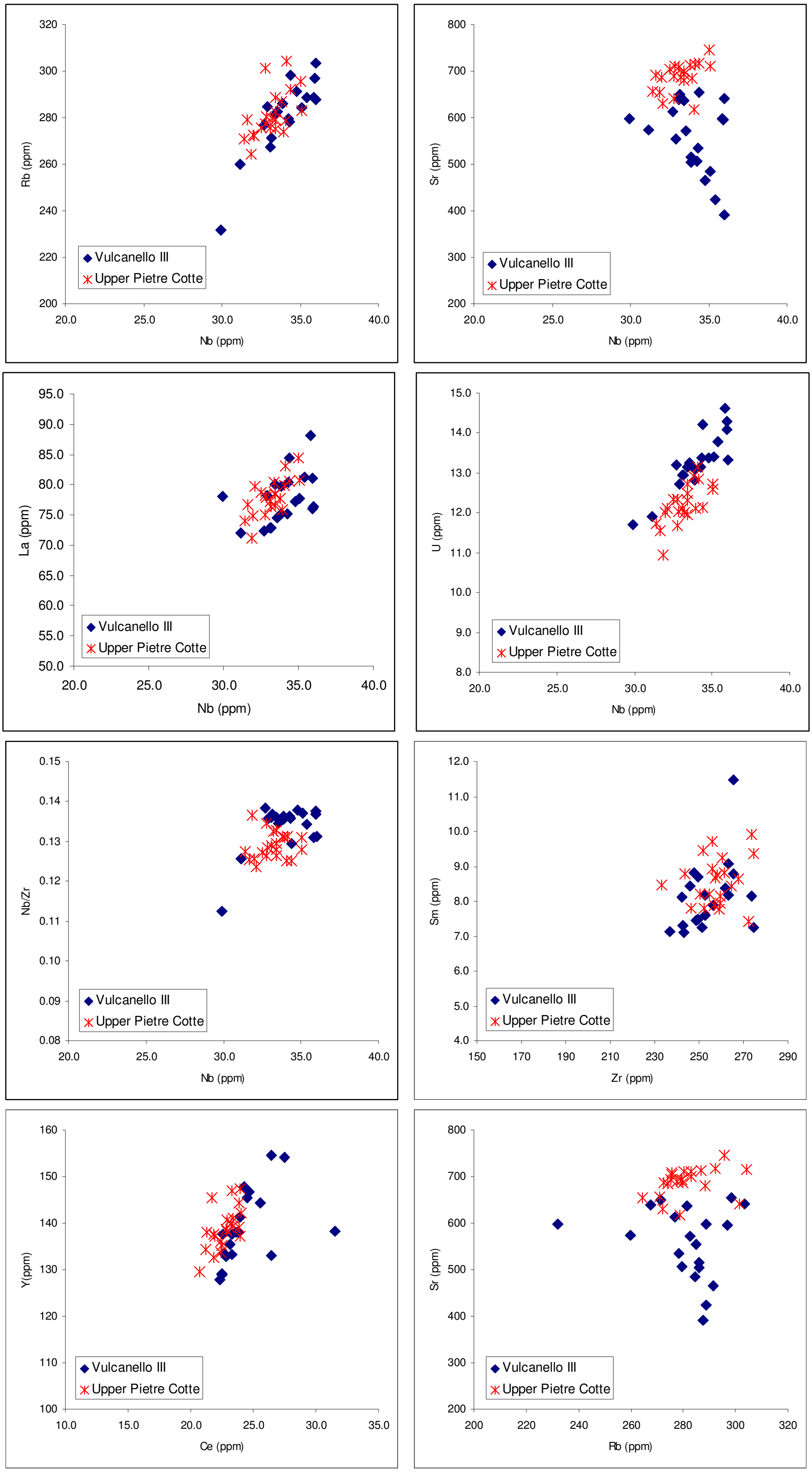



Figure 4.25: Trace element variation plots, including VICE/MICE ratios for the explosive deposits of the Upper Pietre Cotte and Vulcanello III deposits.

Geochemical Plots against Stratigraphic Height

Chemostratigraphic variations are shown in Fig 4.26 and it is clear that the juvenile glass data (solid symbols and lines) for all the deposits are generally more evolved than the previously analysed whole rock data (dotted lines). This is expected as the whole rock results are influenced by phenocrysts which were present in the sample (e.g. clinopyroxenes cause MgO variation).

The glass analysis shows a much more detailed record of temporal variation with the La Fossa glass data revealing three to four magmatic "cycles" involving low silica (*ca.* 55%) and high silica (*ca.* 75%) magmas. This variation is mirrored by variations in other major & minor elements. The most recent activity on La Fossa represents a more silica rich episode in the most recent cycle.

The La Fossa cone erupts more frequently than Vulcanello and has more magmatic diversity in the erupted deposits. However when Vulcanello erupts it produces magmas with a similar composition. Figure 4.26 shows that the deposits from Vulcanello I and II are similar to the low silica magmas which were erupted on La Fossa at the beginning and middle of the Palizzi. We do not have the time resolution to decide whether the input of low silica magmas was pre- or post-cycle. Similarly during more recent eruptions of Vulcanello III, similar magmas were erupted on La Fossa (Pietre Cotte). Trenches dug on Vulcanello (see Chapter 3) show that there are at least two deposits of Vulcanello III, the lower of which separates the Lower and Upper Pietre Cotte deposits and an upper one above the Upper Pietre Cotte unit. The exact temporal relationship between these deposits requires more detailed investigation.

One possible theory is that there is a small magma chamber beneath Vulcanello which is separate to the main chamber beneath La Fossa and the eruptions of Vulcanello can be considered to be a single eruption over time of gradually more fractionated magma. Indeed it may be that the unfractionated magmas of Vulcanello (that overlap in chemistry with the least fractionated magmas erupted at La Fossa) are from the same source. This magmas act as a "mafic" (low silica) trigger that leads to eruption of fractionated magmas (higher silica) from beneath La Fossa and the excess mafic trigger is erupted through Vulcanello (Figure 4.26). So eruptions at Vulcanello & La Fossa have the same mafic trigger but felsic high silica magmas are produced over the intervening time period beneath La Fossa. Vulcanello is the "safety-valve" during any eruption on La Fossa.

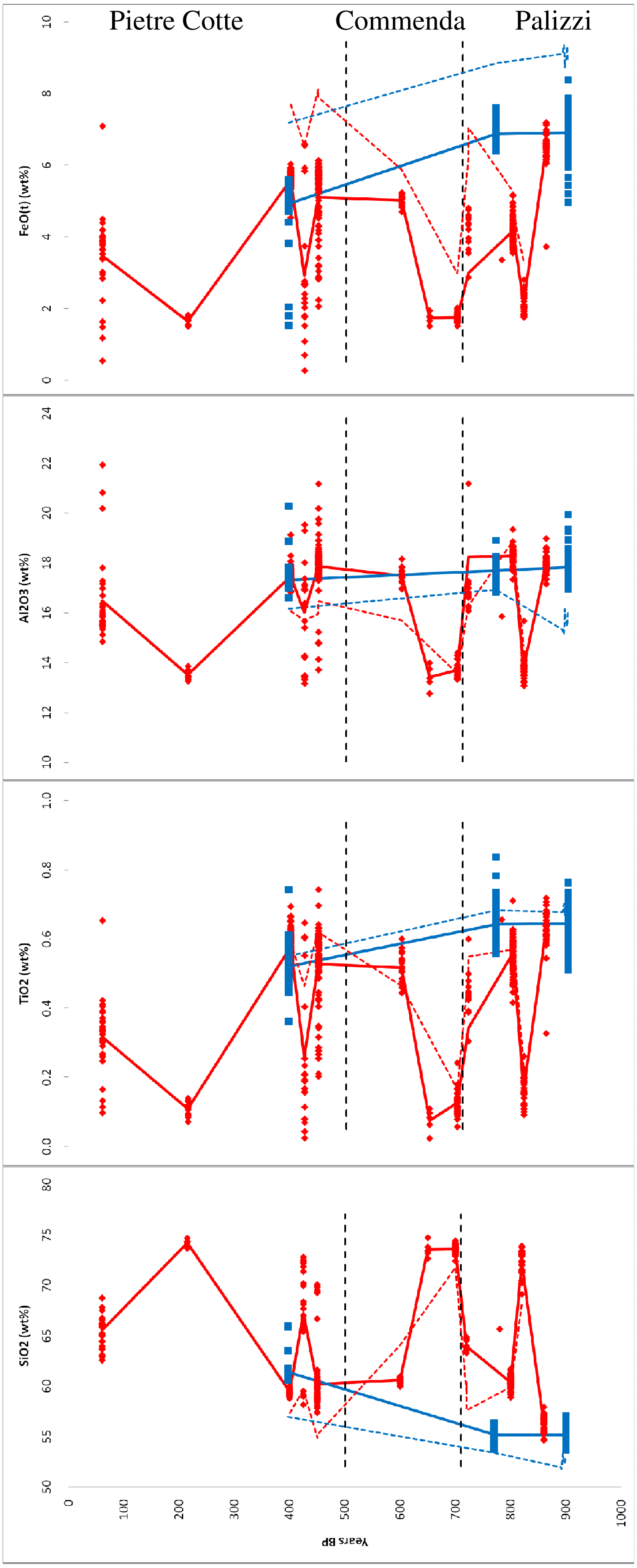



Figure 4.26: Glass Composition vs. Stratigraphic Height. Various major (wt%), plots for both La Fossa (solid red) and Vulcanello (solid blue) against relative stratigraphic height. Relative stratigraphic height deduced from fieldwork and ages (see Chapter 3). The dotted lines show the whole rock data from the previous section for La Fossa (dotted red) and Vulcanello (dotted blue)

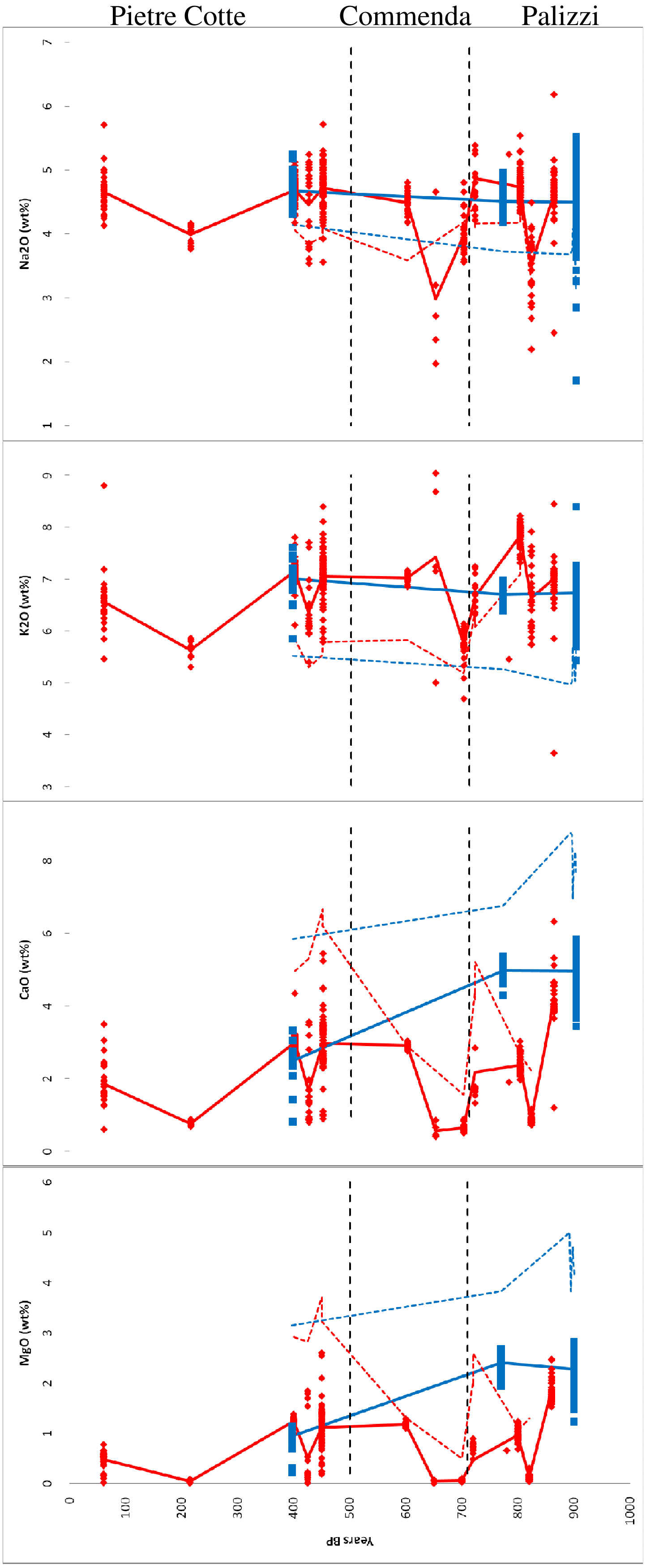



Figure 4.26 (continued): Glass Composition vs. Stratigraphic Height. Various major (wt%), plots for both La Fossa (solid red) and Vulcanello (solid blue) against relative stratigraphic height. Relative stratigraphic height deduced from fieldwork and accepted known ages (see Chapter 3). The dotted lines show the whole rock data from the previous section for La Fossa (dotted red) and Vulcanello (dotted blue)

## 4.7 Conclusions from Glass Analysis

- Glass compositional data reveals greater variability and greater detail than whole rock compositional data.
- Subduction processes are evident in all the glasses - i.e., mantle wedge processes producing a HFSE depletion (Nb, Ta, Zr, Ti) characteristic of island arc magmas
- Shallow sub-volcanic processes are evident in all the glasses - i.e., feldspar fractionation producing depletions in Ba, Sr, Eu
- La Fossa has a much greater magmatic heterogeneity ($SiO_2$ 55 -75%) than Vulcanello ($SiO_2$ 55 -65%)
- Overall La Fossa is dominated by the most evolved magmas ($SiO_2$ 55 -75%) erupted in three to four mafic-felsic cycles in <1ka.
- In the last 1ka three to four magmatic mafic-felsic cycles are evident beneath La Fossa.
- At Vulcanello the erupted magma sequence through time is progressively more fractionated except for Vulcanello II which is a less fractionated. The existence of a single fractionating magma batch could have produced the four sequential products but Vulcanello II may represent replenishment by a less evolved magma batch. This contradicts Davi et al (2009) who proposes a single fractionating batch of magma as a source for the whole sequence.
- The Pietre Cotte (La Fossa) mingled magmas reveal co-existing magmas (59 & 73% $SiO_2$) (i.e. tephri-phonolite to rhyolite).
- From the results of the juvenile glass geochemistry, it can be suggested that the eruptions of Vulcanello have a similar geochemistry to the contemporaneous eruptions of La Fossa.
- La Fossa and Vulcanello are linked as when both eruptive centres are erupting at a similar time, the deposits produced are very similar and are likely to have come from the same magma chamber as the trace element data shows they are from the same source and have undergone similar levels of fractionation.
- Contemporaneous volcanism on La Fossa (Palizzi A) and early Vulcanello I have near identical mantle-normalised profiles – indicating that they possibly came from identical magma batches.
- Contemporaneous volcanism on La Fossa (U Pietre Cotte) and late Vulcanello III have near identical mantle-normalised profiles but show slightly different degrees of

fractionation of feldspar - identical magma batches but Vulcanello magmas have experienced more feldspar fractionation.

- La Fossa and Vulcanello are linked with a longer lived system under La Fossa (cyclical mafic to felsic) and a shorter lived more mafic magma system under Vulcanello
- It is possible to clearly distinguish between the Lower and Upper Pietre Cotte deposits on the basic of their trace element geochemistry even though their major element geochemistry is very similar.
- This trace element data appears to contradict the previous theory (Davi et al 2009) that the eruptions of Vulcanello could be considered as the eruptive event of a single batch of magma whose variation is simply due to fractional crystallisation occurring over time.

## 4.8 References

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# Chapter 5: Zoned Phenocrysts

## 5.1 Introduction to Zoned Clinopyroxene Phenocrysts

Whilst chemically analysing the phenocrysts from within the explosive and effusive deposits of La Fossa and Vulcanello, certain deposits were discovered to contain clinopyroxene phenocrysts which showed signs of zoning. As clinopyroxene (cpx) phenocrysts are useful indicators of the temporal and spatial interaction between chemically distinct magma batches, these zoned cpx phenocrysts were targeted in detail through further analysis. Clinopyroxenes may act as time capsules as they can record subtle changes which have occurred during the volcanic and magmatic processes and which are not revealed with whole rock analysis or glass geochemistry.

The zoned cpx phenocrysts can be used as a time capsule as they may record the influx and interaction of primitive (Mg rich) melts and more fractionated (Fe rich) melts. Variations in the zones with the cpx phenocryst geochemistry can provide 'snap-shots' of the conditions that the magma was under at the time of mineral formation, as well as show how the system has changed over time.

The primary aim of this section is to continue to investigate the effects of the temporal magmatic diversity on Vulcano which has already been reported on the basis of whole rock (Chapter 4.1) and glass (Chapter 4.4) geochemistry. This study will also investigate the evidence for magmatic interplay on both the large (volcanostratigraphy) & the small (individual crystal) scale by exploring the extent to which the new zoned cpx data support or refute the conclusions made from the juvenile glass analyses.

The individual phenocrysts were separated from the same stratigraphic units as the glass samples. The minerals were hand-picked under a binocular microscope, mounted in epoxy resin and left to solidify before the stub was polished. In addition juvenile glass shards containing small phenocrysts were analysed. Each stub surface was mapped and in some cases an SEM-BSE image was taken of the individual phenocrysts, or glass shards containing phenocrysts and microcrysts, to aid in locating optimal surfaces for analysis. Major and minor element abundances were determined using the Electron Microprobe Analysis on a Jeol – 8600 Superprobe at Oxford. Trace element data as individual spot analysis as well as transect analysis for the phenocrysts have been collected at Royal Holloway using LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectroscopy).

A full description of the sample preparation and analytical methodology can be found in Appendix G. Secondary glass and mineral standards were analysed during each run to check the accuracy and precision of the analysis. A full list of the data generated by the EMPA can be found in Appendix G along with the detailed data from the secondary standards (plagioclase and garnet). A full list of the new data generated by LA-ICP-MS can also be found in Appendix G along with the detailed data from the secondary standards (i.e., atho, gor 128 and StHs 6/80).

## 5.2 Vulcanello Lava Platform

The Vulcanello Lava Platform (sample AT16) which forms the base of the Vulcanello peninsula has an age of approximately 850 years BP (see Chapter 3 for details). The Vulcanello Lava Platform contains many phenocrysts of clinopyroxene with minor abundances of plagioclase feldspar, K-feldspar and olivine as well as some small microcrysts of apatite. The glass matrix for these crystals has an average silica content of 65 wt %. Whilst using the SEM, one clinopyroxene phenocryst appeared to show signs of zoning, which meant that it was specifically targeted in subsequent geochemical analysis.

Major element geochemical analysis of the suspected zoned cpx phenocryst was carried out by spot analysis of EMPA. Figure 5.1 shows the geochemistry of the core, middle and rim of the cpx phenocryst compared to other apparently unzoned cpx phenocrysts from the same deposit. The cpx phenocrysts from the Vulcanello Platform lava have a large range in Mg#, from 0.58-0.79 and a correspondingly large range in FeO wt% (from 4.2 to 9.2%). The majority of the unzoned phenocrysts plot in the low Mg, high Fe range, but there is a near continuous variation in composition toward high Mg, low Fe compositions. The data from the zoned cpx phenocryst shows that:

(a) the core reflects the presence of a relatively fractionated melt;

(b) the middle zone reflects the presence of a range in melt compositions covering a significant amount of the compositional range seen in the unzoned phenocrysts;

(c) the rims reflect the presence of low Mg, high Fe melts similar to the majority of the phenocrysts.

This could be explained in terms of distinct magma batches of relatively different composition: a low Mg, high Fe magma "evolved" felsic magma and a high Mg, low Fe "less evolved" mafic magma. The whole rock (Chapter 4.1) and glass (Chapter 4.4) geochemistry recorded similar extremes of magma composition.

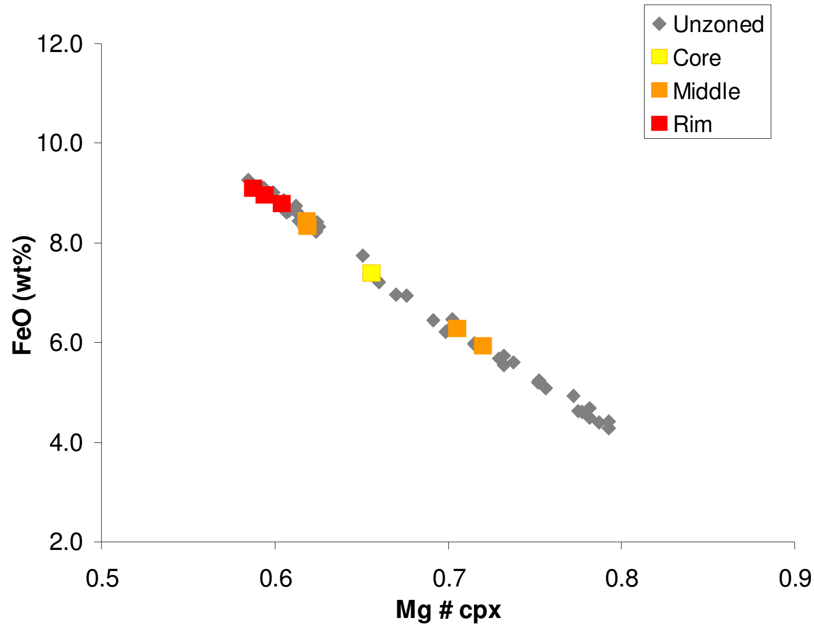



Figure 5.1: FeO wt% against Mg# for unzoned cpx phenocrysts and zoned cpx from the Vulcanello Lava Platform.

Figure 5.2 shows core to rim major element variation within a zoned cpx phenocryst displaying five distinct zones around a core. The oldest part of the phenocryst, the core, has low concentrations of Mg, Si and Ca and high concentrations of Fe, Al and Ti. The five zones were not all analysed by EPMA but show fluctuations in the concentrations of Mg, Si, Ca, Fe, Al and Ti. From these data it is clear that there is a switch in chemistry in response to the presence of Fe rich and Fe poor melts. The youngest, outer rim, has the lowest concentration of Mg, Si and Ca as well as the highest concentration of Fe and Al.

The SEM-BSE image for the Vulcanello Platform lava (Figure 5.3) show that the zoned cpx is a euhedral pyroxene which means that it is likely that the augite rim of the cpx phenocryst formed whilst it was in equilibrium with the melt. The zoned cpx phenocryst from the Vulcanello Lava Platform shows oscillatory zoning and can generally be described as containing a low Fe high Ca core (diopside) core with successive growth rims (1-5). The outer rim is Fe-Ti augite compared to the diopsidic core.

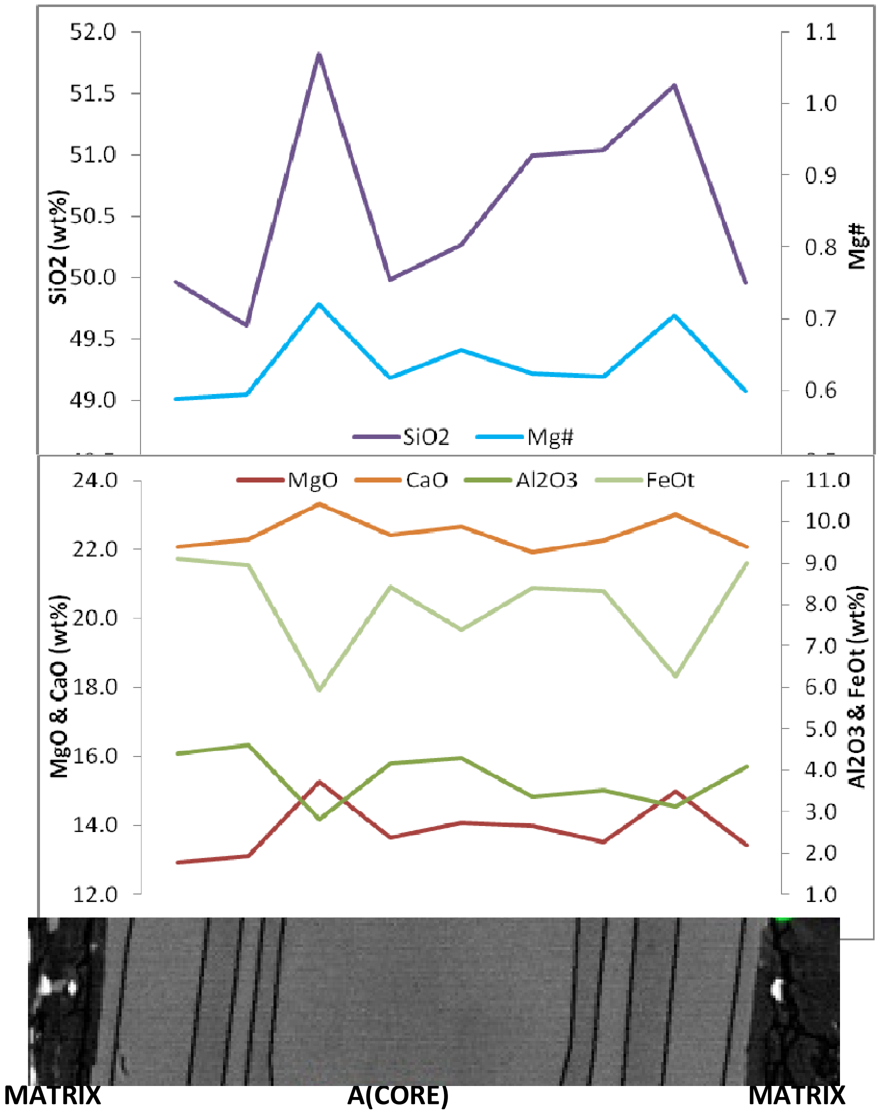



Figure 5.2: Core to rim variations in major element concentrations in a zoned cpx phenocryst from the Vulcanello Platform lava.

Although the major element results are useful and confirm that the zoning seen is as a result of geochemical variation within the phenocryst, the spot method is not ideal as some of the zones are smaller than the spot meaning that the data produced is a mixture of more than one zone. To overcome this problem during the trace element analysis, continuously analysed transects were carried out using the LA-ICP-MS, so that all subtle variations in the crystal geochemistry can be seen. Two different transects were analysed in the Vulcanello Lava Platform cpx. Figure 5.3 shows an SEM-BSE image of the complete crystal and the position of the two laser tracks.

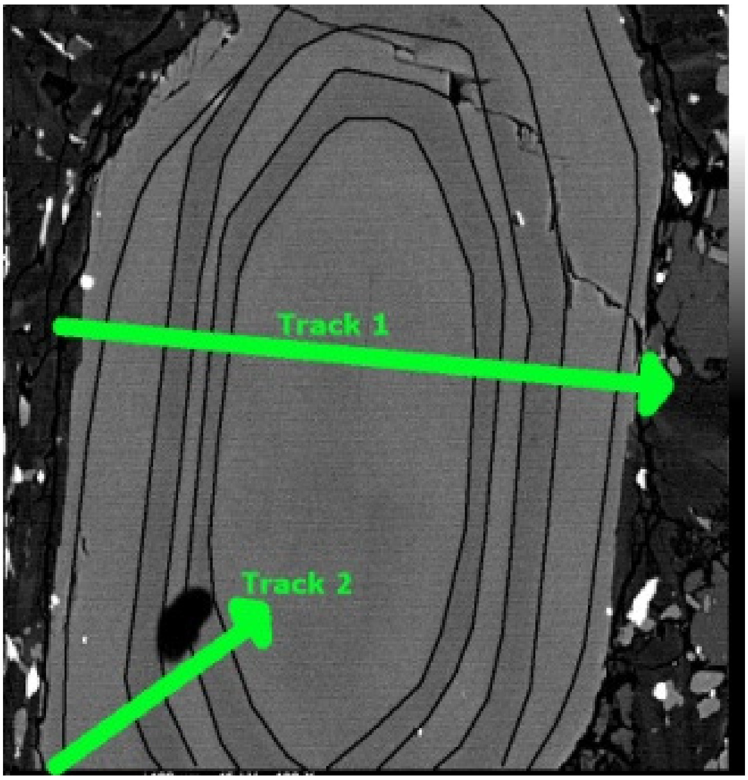



Figure 5.3: SEM-BSE image of the zoned cpx phenocryst from the Vulcanello Lava Platform deposit. Five zones (1-5) surround a core (A). The locations of the two laser ablation transects are highlighted.

A selection of trace elements from the Track 1 transect are shown in Figure 5.4. The path of Track 1 begins and ends in the glass each side of the phenocryst and travels through the centre at a right angle to the long axis. A decrease in Sr abundance (Figure 5.4) as well as Ba, gives a clear indication of where the glass ends and the crystal begins. The glass has over 1000 ppm Sr and the cpx phenocryst has *ca.*200 ppm Sr. The other elements shown in Figure 5.4 are Sc, V and Cr.

In contrast to the major element EPMA data, the trace element transect reveals the true detail of the five zones around the core. The core has relatively high concentrations of Sc and Cr and low V and this “composition” is also repeated in zones 2 and 4. In contrast zones 1,3 and 5 are Cr-Sc poor and rich in V. This is at odds with the EPMA data (Figures 5.1 & 5.2) and highlights some of the analytical difficulties, especially being able to exactly place the EMPA spot analysis on the actual rim when they are very narrow.

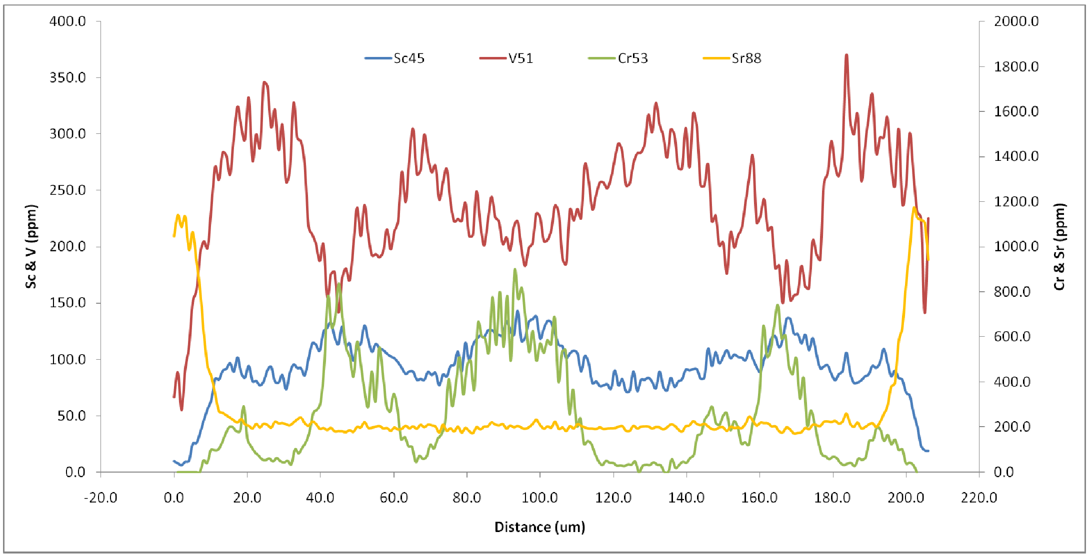



Figure 5.4: Trace element concentrations (Track 1) across five zones (1-5) around a central core (A). The transect goes from the glass, into the core of the cpx phenocryst and back into the glass.

A second, shorter laser ablation transect (Track 2) was also carried out on the zoned cpx phenocryst from the Vulcanello Lava Platform. A comparison of the Ni, Cr and Sc concentrations of the two tracks is shown in Figure 5.5. Despite some subtle variations the two tracks are comparable and Cr in particular highlights the 5 zones around the Cr rich core with a repetition of Cr rich compositions in zones 2 and 4. The slight offset in the two tracks is likely to be due to slight variations in the thickness of the rims which can be seen in the SEM-BSE image of the crystal.

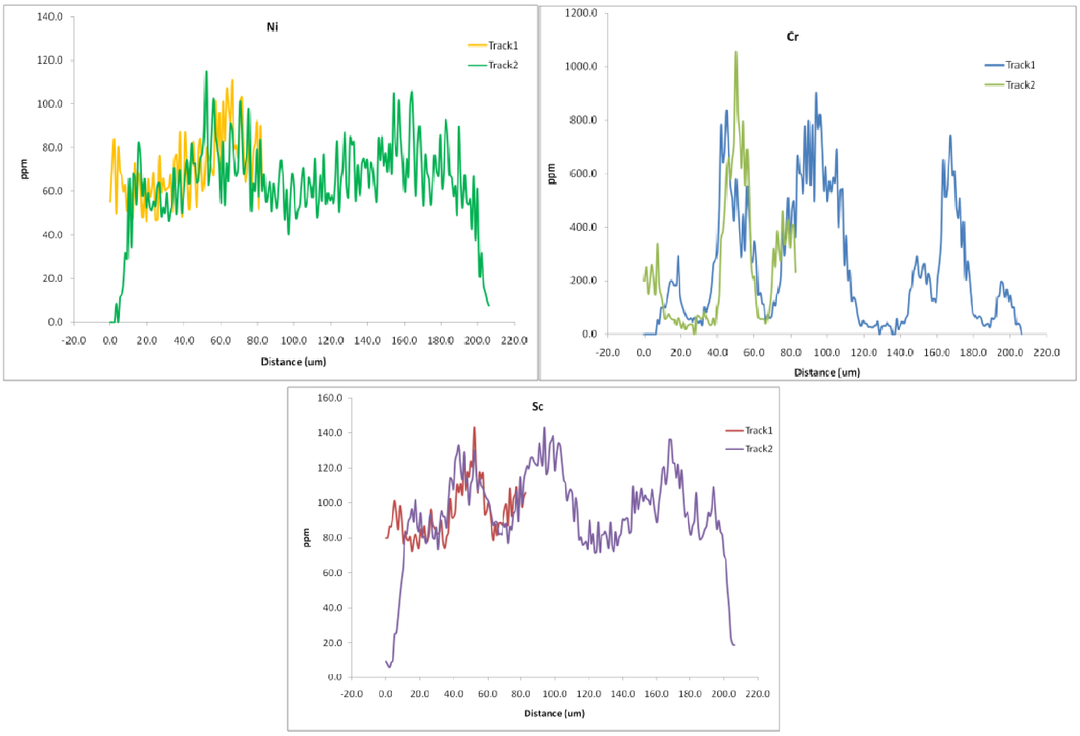



Figure 5.5: Comparison of Ni, Cr and Sc abundances for two transects in the zoned phenocryst from the Vulcanello Lava Platform. Note that the five zones are very clear on the Cr plot.

These data show that it is likely that the oscillatory zoning records a high level interplay between Cr-Sc rich and V rich, Cr poor magma batches. This may have resulted from the incorporation of the phenocryst(s) in a dynamic magma system that was being replenished by Cr-Sc rich, V poor magmas (mafic) and/or mixing with V rich, Cr poor (felsic) magmas .A Alternating cycles of fractionation and replenishment may have occurred in the magma chamber beneath Vulcanello. Repeated replenishment of the shallow magma system with less evolved, more mafic magmas from deeper regions would have triggered a reaction due to disequilibrium. This reaction led to the formation of zones indicated by diopside (higher Mg, lower Fe). Between the replenishment by the mafic magma, the melt evolved due to high level fractionation and produced rims which have a more augitic composition. In order for this to have been the case, the five zones must have recurred over the relatively short lifetime of the magma system.

### 5.3 Roveto Lava, Vulcanello III

The Roveto Lava flow is the youngest lava flow on Vulcanello and has an age of approximately 400 years BP (see Chapter 3 for details). The Roveto Lava flow contains many phenocrysts of clinopyroxene with minor amounts of olivine, plagioclase feldspar and K-feldspar in a glass matrix with an average silica content of 60 wt %. Whilst using the SEM to study the deposits, no zoned phenocrysts but during EMPA analysis one of the clinopyroxene phenocrysts showed signs of zoning. (Sketch of the crystal is shown in Figure 6.6a) It is likely that there is zoning in other phenocrysts which was not visible but for this research, only phenocrysts with obvious zoning were studied. Cpxs found within the Roveto lava generally have a euhedral form and are not resorbed which implies that it was in recent equilibration with the melt.

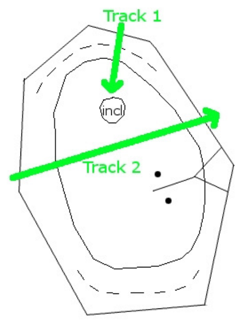



Figure 5.6a: Sketch of the zoned cpx from the deposits of the Roveto Lava.

Figure 5.6 shows how the geochemistry of the core, middle and rim of the cpx phenocryst compared to unzoned cpx phenocrysts from the same rock. The cpx phenocrysts from the Roveto lava have a large range in Mg#, from 0.44-0.80 and a correspondingly large range in FeO wt% (from 4.2 to 14.3%) greater than that observed in the Vulcanello Lava Platform sample. The majority of the phenocrysts (about 60 %) plot with an Mg# =0.6 and Fe = 8-10 wt%, but overall there is a continuous variation in composition toward high Mg, low Fe. A few of the unzoned phenocrysts have highly evolved compositions with very low Mg# and a very high Fe. The data from the zoned cpx phenocryst show that the core and rim have near identical compositions lying within the range of compositions of the phenocrysts. The intermediate zones in the zoned cpx have less evolved compositions toward high Mg# and lower FeO content.

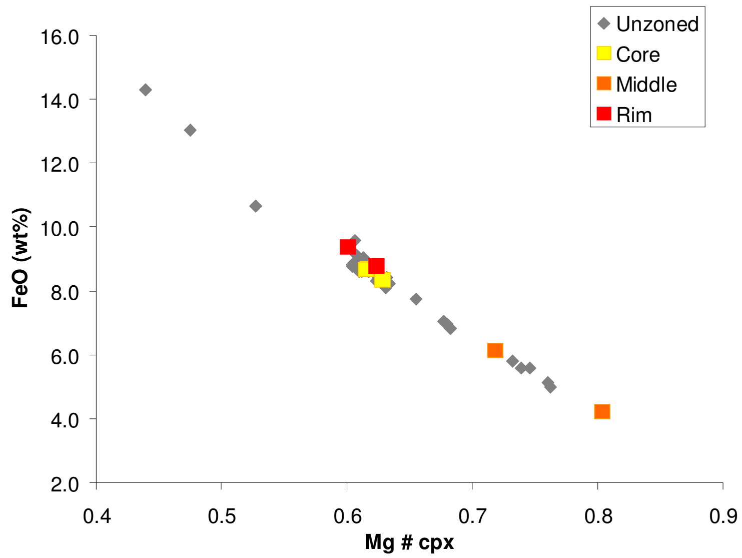



Figure 5.6: FeO wt% against Mg# for zoned and unzoned cpx phenocrysts from the Roveto Lava deposit.

As in the case of the Vulcanello Lava Platform the cpx composition varies between a Mg-Ca rich, Fe poor diopside and a Mg-Ca poor, Fe rich augite. However in the Roveto the overall variation is greater than observed for the VLP (Mg#=0.57-0.8). Figure 5.7 shows major element variation from core to rim across the four zones of the zoned cpx phenocryst. However the resolution of the EPMA data does not clearly show these zones but they are apparent in the LA-ICPMS data (Fig 5.8). In general we can observe that the presumed oldest part of the phenocryst, the core, has low concentrations of Mg, Si and Ca and high concentrations of Fe, Al and Ti (possibly Fe-Ti augite). One of the analysed zones shows a rather different composition and has high concentrations of Mg, Si and Ca (diopside) together with lower concentrations of Fe, Al and Ti. Finally, the youngest, outside rim or zone, has the lowest concentration of Mg, Si and Ca as well as the high concentrations of Fe and Ti (not shown on the diagram).

The phenocryst from the Roveto Lava can be described as showing oscillatory zoning. The core appears to have a Fe-Ti augite composition, one of the analysed inner zones a more Mg-Ca diopside composition, and the outer zone/rim which a Fe-Ti augite composition. The cpx found within the Roveto lava generally show euhedral pyroxenes which means that it is likely that the augite rim in the zoned cpx formed in equilibrium with the melt.

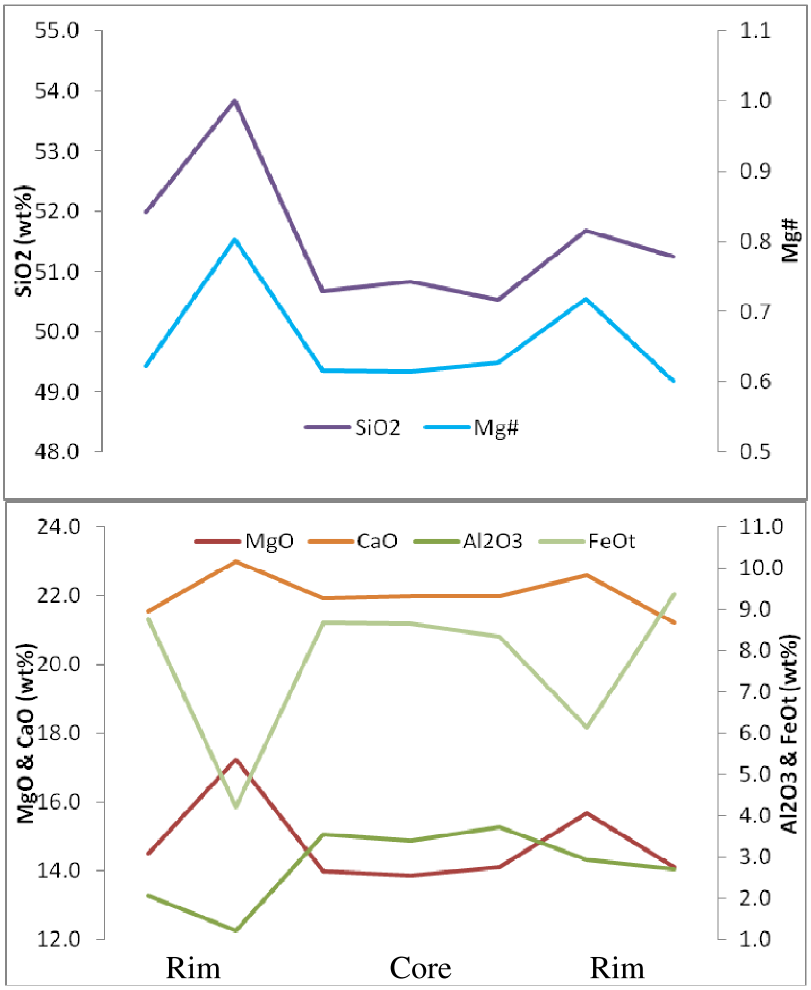



Figure 5.7: Rim to core to rim variations in major element concentrations from the zoned cpx phenocryst from the Roveto Lava

Figure 5.8 shows the trace element variation for Sc, V and Cr across the zoned cpx.. As in the case of the VLP, Sr (Figure 5.8) is used to define the boundary between the matrix glass (*ca* 2000 ppm) and the phenocryst (*ca* 200ppm).

Similar to the trace element profile of the Vulcanello Lava platform cpx, the trace element profile of the cpx found within the Roveto Lava gives more detail than was seen in the major element data. However, unlike the cpx from the Vulcanello Lava Platform, the core of the Roveto Lava phenocryst has low concentrations of Sc and Cr, and a high concentration of V (augite) which is consistent with the EPMA data (high Fe-Ti). The trace element transect reveals four zones between the core and the glass matrix. Zones 2 and 4 are Cr poor like the core and zones 1 and 3 are Cr rich.

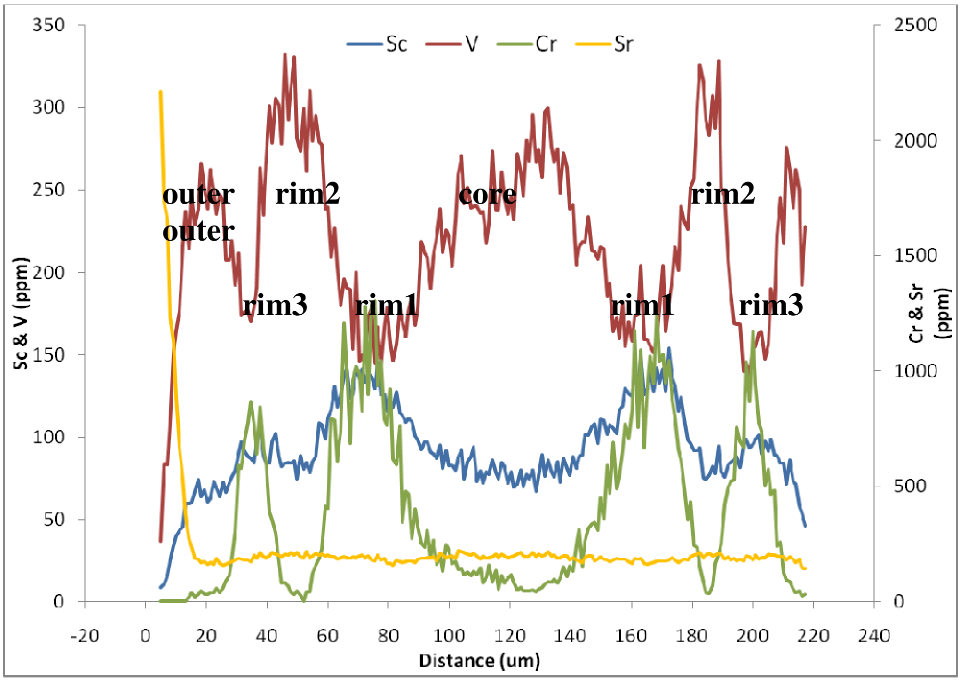



Figure 5.8: Trace element concentrations in a zoned cpx in the Roveto Lava. The transect goes from the glass, into the core of the cpx phenocryst and back into the far rim.

The Roveto Lava zonation differs from that of the Vulcanello Lava Platform in that the core compositions are different and the number of zones. However both reveal a relatively "rapid" alternation between a Fe-Ti-V rich composition and a Mg-Ca-Cr-Sc rich composition. Both the Roveto Lava and the VLP zoned cpx support the suggestion of an alternating cycle of fractionation and replenishment in the magma chamber beneath Vulcanello during the last 1ka. Figure 5.8 reveals a systematic change from the diopside zones to the augite zones indicating repeated replenishment of the shallow, more evolved, felsic magma system with less evolved, mafic magmas possibly from deeper regions. For both zoned phenocrysts, the mafic magma appears to form diopside rims with a high Sc & Cr, low V and the more evolved magma forms augite rims with high V, low Sc Cr.

### 5.4 Vulcanello III – explosive deposit

The explosive deposits of the Vulcanello III eruption are the youngest on Vulcanello with an age of approximately 397 years BP (see Chapter 3 for details). The Vulcanello III explosive deposits mainly consist of a glass matrix which has an average silica content of 61 wt %. The deposits contain several phenocrysts of clinopyroxene with minor abundances of plagioclase feldspar, K-feldspar and olivine and some small microcrysts of apatite. Whilst using the SEM to study the deposits, several small clinopyroxene phenocrysts showed signs of zoning (some of these are shown in Figure 5.9). The SEM-BSE images for the Vulcanello III explosive deposits (Figure 5.9) show that the zoned cpx are euhedral pyroxenes which mean that the rims of the zoned phenocrysts are in equilibrium with the co-existing melt. Unlike the zoned cpx phenocrysts from the lava flows which showed oscillatory zoning, the zoned cpx phenocrysts from the explosive deposits of the Vulcanello III eruption exhibit normal zoning (Figure 5.9 & Figure 5.10).

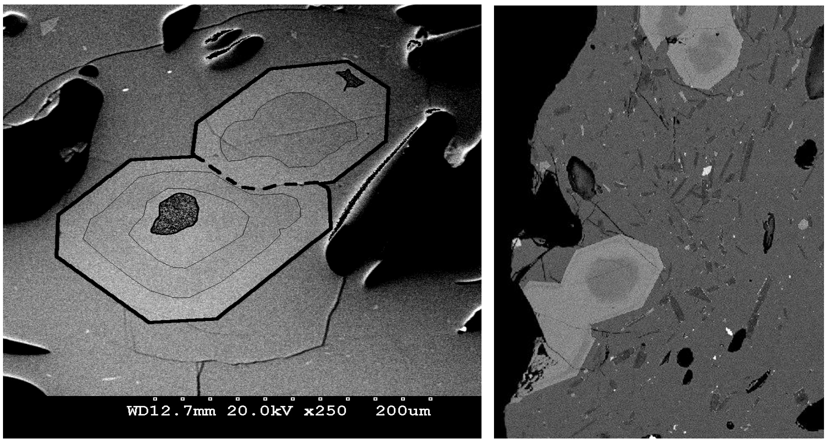



Figure 5.9: SEM-BSE images of several zoned cpx phenocrysts from the Vulcanello III explosive deposits.

A total of six zoned cpx phenocrysts were found within the explosive deposits of Vulcanello III. Major element geochemical analyses of these cpx phenocrysts, as well as other unzoned cpx phenocrysts, were carried out by EPMA spot analysis. Figure 5.10 shows how the geochemistry of the core, middle and rim of the zoned cpx phenocrysts compare to other apparently unzoned cpx phenocrysts from the same deposit. The cpx phenocrysts from the Vulcanello III explosive deposits have a large range in Mg#, from 0.58-0.82 and a correspondingly large range in FeO wt% (from 4.0 to 10.2%). Like the VLP and the Roveto these define a nearly continuous variation between two distinct magma compositions: high Mg-Ca and high Fe-Ti. Unlike the VLP and the Roveto the cores of the zoned cpxs have the highest Mg# and the lowest FeO content. Overall the range in FeO and Mg# compares favourably with the VLP but differs from the Roveto which tends toward more fractionated (high FeO) cpx compositions.

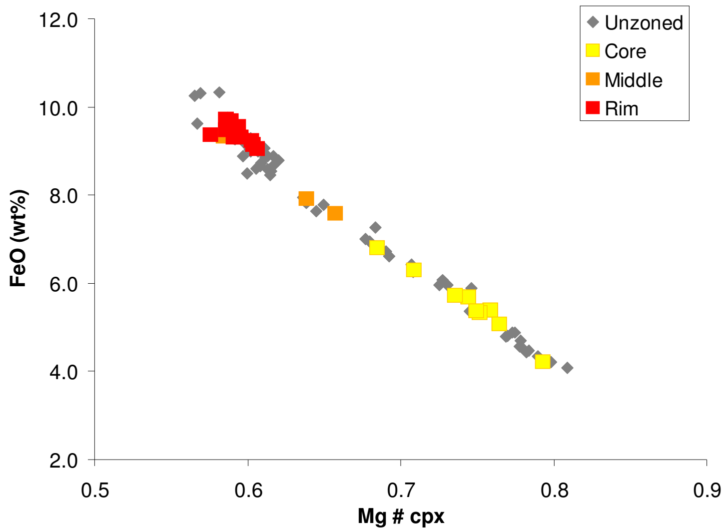



Figure 5.10: FeO vs. Mg# for zoned crystals & unzoned cpx from Vulcanello III. The linear trend defines two extreme magma compositions.

Four transects across the zoned cpx phenocrysts reveal Mg rich diopsidic cores with Mg poor (Fe-Ti rich) augitic rims (Figure 5.11). The SEM-BSE images for the Vulcanello III explosive deposits (Figure 5.9) show that the zoned cpx are euhedral pyroxenes which mean that the augite rim of the phenocrysts is likely to have formed whilst it was in equilibrium with the melt.

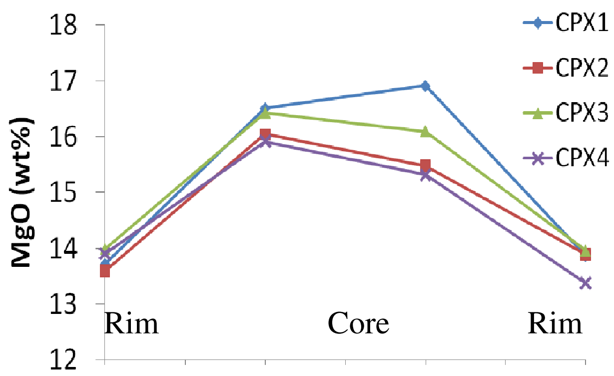



Figure 5.11 : Core to rim variations of Mg (wt%) in zoned clinopyroxene from Vulcanello III deposits

Figure 5.12a shows clearly the change in concentration of Sc, V, Cr and Sr across the phenocryst. The core has relatively high concentrations of Sc and Cr along with low concentrations of V and the concentration of V increases towards the rim and the concentrations of Sc and Cr correspondingly decrease.

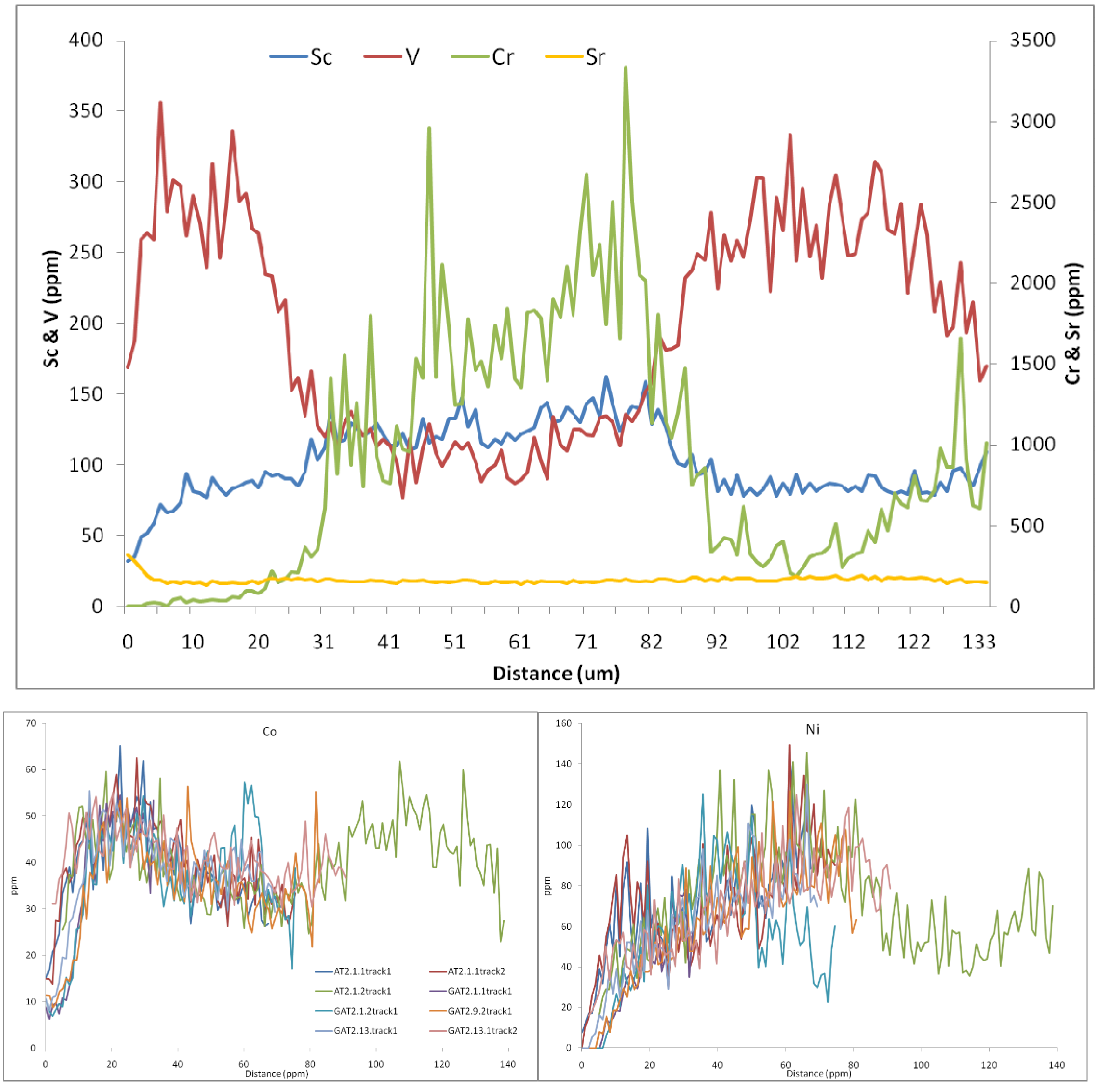



Figure 5.12: a) Rim to core to rim trace element variations in a zoned cpx from Vulcanello III deposits. b) Co concentrations from all the known zoned cpx Vulcanello III phenocrysts. c) Ni concentrations from all the known zoned cpx Vulcanello III phenocrysts.

Figures 5.12b and 5.12c show how the rim to core transects of the other five zoned cpx phenocrysts all show the same general pattern of a less evolved core becoming more evolved towards the rim. It can also be noted that the normal zoning of the cpx from the Vulcanello III explosive deposits matches with the outer rims of the cpx phenocryst from the Roveto Lava. It can also be noted that these two deposits have a similar silica content in their glass (60-61 wt%).

### 5.5 Pietre Cotte Lava

The Pietre Cotte lava which is the youngest lava flow from the La Fossa crater has an age of approximately 215 years BP (see Chapter 3 for details). The Pietre Cotte lava is predominantly an obsidian lava flow and contains very few phenocrysts of clinopyroxene, plagioclase feldspar and K-feldspar as well as some small microcrysts of apatite in a glass matrix with an average silica content of 74 wt %. Whilst using the SEM to image the deposits one clinopyroxene phenocryst was found to be zoned (Figure 5.13), which meant that it was specifically targeted in subsequent geochemical analysis. The SEM-BSE image showed that the cpx from the Pietre Cotte lava has corroded and embayed margins which indicates that the cpx was not in equilibrium with the co-existing melt

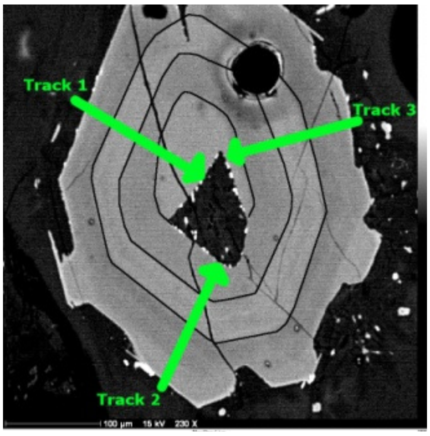
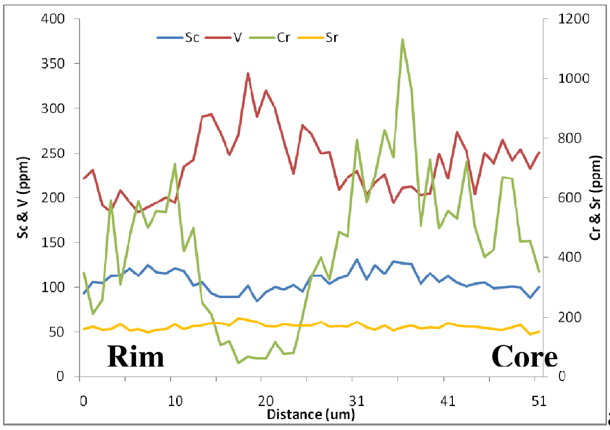


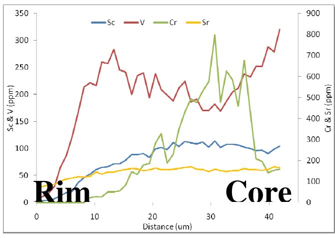

Figure 5.13: SEM-BSE image of the zoned cpx phenocryst from the Pietre Cotte Lava Flow deposit. The locations of the three laser ablation transects are highlighted.

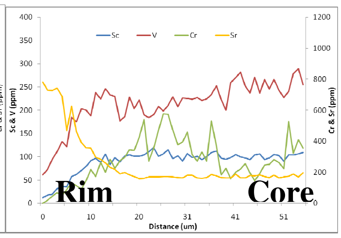
Figure 5.14 shows trace element variation across three transects in the zoned cpx phenocryst within the Pietre Cotte lava flow. Unlike the multiple transects analysed on cpx from the Vulcanello Lava Platform or the Vulcanello III explosive deposits, the three transects carried out on this phenocryst produces data that does not match. This is probably due to the crystal being too thin which means that Track 2 and Track 3 need further investigation before comparisons can be made.

Track 1 shows a high V low Cr core surrounded by 3 zones, where zone 2 and possibly the outer very faint 4th zone have a similar high V composition. These zones are divided by zone 1 which has a high concentration of Cr and Sc.




a)PCLava, Track 1 .




b)PCLava, Track 2 c)PCLava, Track 3

Figure 5.14: Three traverses across the zoned cpx from Pietre Cotte showing trace element variations from the core across three or possibly four zones.

## 5.6 1888-90 – explosive (AT13)

The products from the 1888-90 eruption are the youngest deposits on La Fossa and have an age of approximately 61 years BP (see Chapter 3 for details). The 1888-90 deposits contain phenocrysts of clinopyroxene, plagioclase feldspar, K-feldspar and olivine as well as some small microcrysts of apatite in a glass matrix with an average silica content of 65.5 wt %. No zoned phenocrysts were seen using the SEM but during subsequent EMPA analysis, two zoned clinopyroxene phenocrysts were discovered, which meant that these were targeted in during further geochemical analysis. The zoned cpx is a euhedral pyroxene which means that the diopsidic rim of the phenocryst. A sketch of the zoned cpx phenocrysts is shown in Figure 5.15.

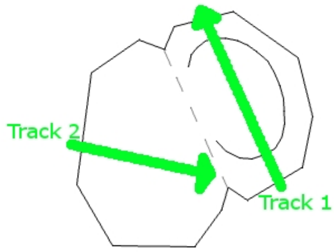



Figure 5.15: Sketch of the zoned cpx from the deposits of the 1888-90 Eruption.

A transect reveals a Mg poor (Fe-Ti rich) augitic core with Mg rich diopsidic rim (Figure 5.16) revealing reverse zoning like the Pietre Cotte (La Fossa) and the Roveto (Vulcanello) cpxs This reverse zoning is a result of when phenocrysts move from a more evolved magma composition to a less evolved magma and rather than dissolving the original phenocryst, a rim which is stable in the new magma is precipitated.

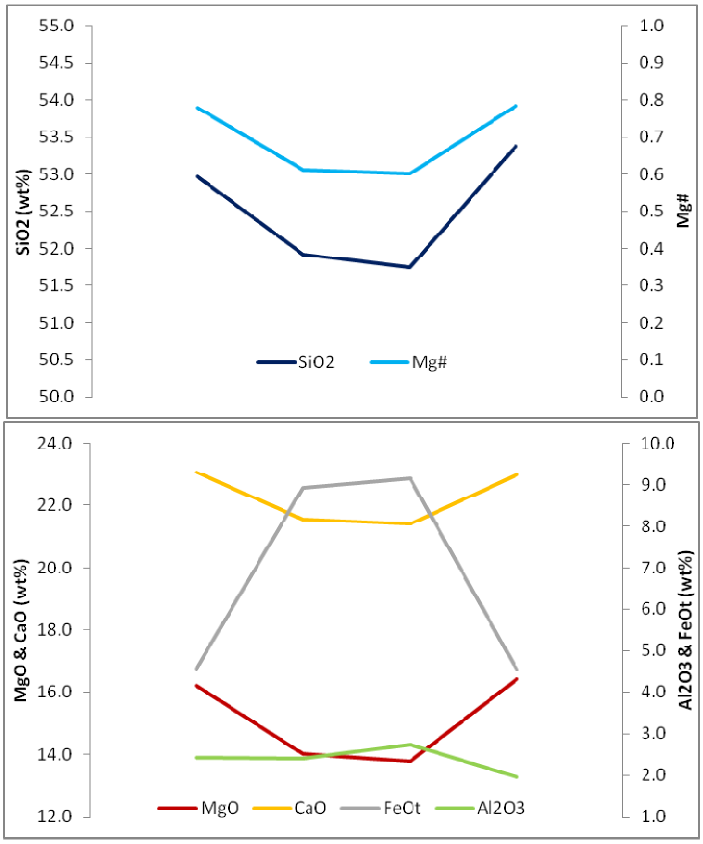
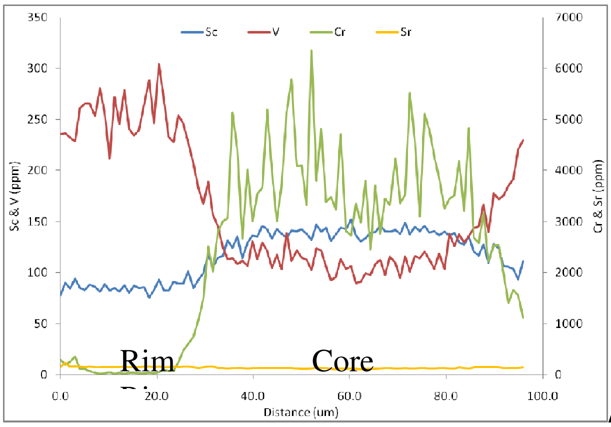
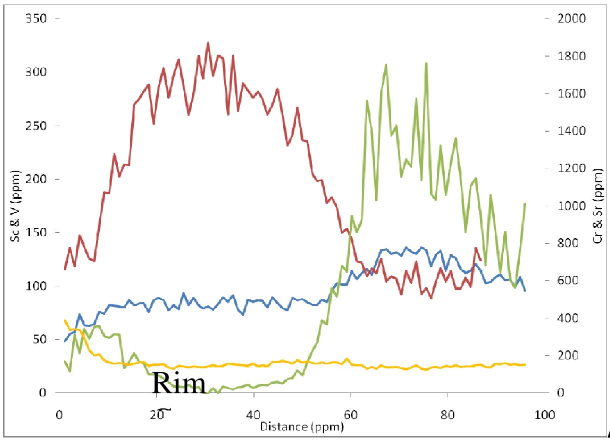



Figure 5.16: Major element variations across a zoned cpx phenocryst from the 1888-90 eruption.

Figure 5.17 shows variations in Sc, V, Cr, and Sr for two transects across the phenocryst. In both tracks 1 and 2 the core has relatively high concentrations of Sc and Cr along with low concentrations of V. The concentration of V significantly increases towards the rim/zone and the concentrations of Sc and Cr correspondingly decrease. The reason the trace element data does not appear to match with the major element data (Figure 5.16) is likely to be the accuracy in the positioning of the EMPA spots.




AT13.13.1track1




AT13.13.1track2

Figure 5.17: Trace element concentrations from along two traverses across a zoned cpx from the 1888-90 eruption

## 5.7 Conclusions

Zoned clinopyroxenes (cpxs) were found in five different explosive and effusive deposits on La Fossa (2 units) and Vulcanello (3 units). As time capsules of magma dynamics they can inform us about magma behaviour beneath Vulcanello and, to some extent, La Fossa. The zones are either normal, reverse or oscillatory in nature and can consist of 2-5 zones. In relation to co-existing phenocryst in the host magmas, the compositional variation of the zones and cores is within the variation observed in the phenocrysts. It is clear from the EPMA and LA-ICPMS traverses across the zoned crystals that there are marked but systematic compositional changes between cores and zones and between zones. Overall the zonation reveals the co-existence of two extreme magma compositions which can exist as either cores and/or zones around cores. At one extreme there is a relatively less fractionated magma composition characterised by Ca-Mg-Cr-Sc rich cores and rims and at the other extreme a relatively fractionated Fe-Ti-V rich magma. On Vulcanello, the Vulcanello Lava Platform and Vulcanello III deposits contain zoned cpxs with Ca-Mg-Cr-Sc rich cores and up to five zones where the composition switches to a Fe-Ti-V composition.

Chemical zonation in cpxs show similar magma dynamics as was seen in the temporal variations in glass chemistry in juvenile clasts from Vulcanello and La Fossa. Co-existing compositionally distinct magmas at high level within the magma system is apparent from both studies. More specific conclusions are listed below:

1. Zoned cpx from the Vulcanello Lava Platform (VLP) exhibits oscillatory zoning with five zones surrounding a Mg rich diopside core. Zones 2 and 4 have similar compositions to the core whilst zones 1, 3 and 5 reflect the presence of Mg-Cr poor, Fe-Ti rich magmas (i.e. more fractionated).
2. Zoned cpx from the Roveto Lava flow exhibits oscillatory zoning but, unlike the VLP the core is Mg-Cr poor and surrounded by four zones. Zone 1 and 3 reflect the presence of Mg-Cr rich magmas whereas zones 2 and 4 reflect the presence of Fe-Ti rich magmas.
3. Zoned cpx from Vulcanello III comprise a Mg-Cr rich core surrounded by a Fe-Ti rich zone. All the zoned cpx phenocrysts analysed showed a similar pattern.
4. Recent La Fossa volcanic rocks contain less well developed zoned cpxs with the Pietre Cotte containing a zoned cpx with three zones surrounding a Cr -poor core. This is very different to the contemporaneous explosive activity of Vulcanello III but similar to the Roveto lava which contains zoned cpx with four zones around a Cr –poor core.
5. The 1888-1889 flow contains a zoned cpx with a Cr poor core surrounded by possibly two zones reflecting high level magma interaction involving magmas at different stages of fractionation.

# Chapter 6: Conclusions

This research has focused on the recent (<2 ka) history at the La Fossa and Vulcanello eruptive centres on Vulcano and the small - scale cyclicity found within these deposits, rather than the changes in the petrology and chemistry over timescales of 100 Ka to 1 Ma years which had previously been studied. The explosive and effusive products from both La Fossa & Vulcanello have been analysed by a variety of different methods (ICP-AES, ICP-MS, EMPA & LA-ICP-MS), meaning that it is now possible to see in detail the geochemistry of the different phases of each eruption.

A review of previously published research showed that the magma plumbing system below the La Fossa vent on Vulcano, Italy had been identified as comprising two magma systems: a shallow, evolved, felsic component and a deeper, less evolved, mafic component. Mafic - felsic magma mixing and mingling was reported in erupted products that were younger than the Palizzi cycle. Similar deposits have been found on both Lipari and Salina where the mixing of the felsic and mafic magmas triggered the explosive eruptions.

A review of previously published chronological data concludes that both La Fossa and Vulcanello formed during the last 1000 years BP and have a possible maximum age of 3000 years BP, if Ra-Th data are included. Charcoal was found within the Commenda pyroclastic deposits which lie above the Monte Pilato (Lipari) marker horizon (*ca.* 1230 AD) and the Vulcanello lava platform (*ca.* 1100 AD). The $^{14}C$ dates from the charcoal reveal that the eruption from La Fossa that produced the Commenda Ash occurred between 1260-1470 AD, which is chronostratigraphically acceptable. The charcoal sample which was dated through $^{14}C$ dating as being older, is possibly due to older charcoal being entrained during a fall event, or due to the plant, which formed the charcoal sample, growing near to a fumarole which affected its $^{14}C$ levels.

A comprehensive study of stratigraphically constrained magmatic samples (juvenile explosive clasts and effusive rocks) from La Fossa and Vulcanello found that the chemical variation within these rocks agrees with the published range previously reported for Vulcano. Overall it is possible to say that the La Fossa and Vulcanello magmas have a composition of the calc-alkaline, shoshonitic series (shoshonitic basalt - latite - rhyolite). The glass compositional data reveals greater variability and detail than the whole rock compositional data.

From both the whole rock and the juvenile glass data, it is possible to see that the overall geochemistry of the magma beneath Vulcano is affected by deep subduction-related contributions clearly seen in the ubiquitous depletion in HFSE (Nb-Ta-Zr-Hf-Ti) which is characteristic of island arc magmas. Shallow sub-volcanic or crustal processes are also seen to affect the La Fossa and Vulcanello magmas. The fractionation of plagioclase, alkali feldspar and magnetite are all evident in major (Ca, Al), minor (Ti) and trace element (Ba, Sr, Eu) variations. The detailed glass data reveals that La Fossa has much greater magmatic heterogeneity ($SiO_2$ 55 -75%) than Vulcanello ($SiO_2$ 55 -65%).

Chronostratigraphic analysis of the geochemical data from La Fossa reveals that in the last 1ka three to four magmatic mafic-felsic cycles are evident beneath La Fossa. The geochemical cycles do not match exactly with the named cycles (the Palizzi, the Commenda and the Pietre Cotte) which have been identified through geological mapping. One of the samples from the Pietre Cotte eruption of La Fossa consisted of mingled magmas confirming that co-existence of the mafic and felsic magmas (59 & 73% $SiO_2$)(i.e. tephri-phonolite to rhyolite).

At Vulcanello, over time, the erupted magma sequence generally becomes progressively more fractionated with the exception of Vulcanello II which is less fractionated than the previous Vulcanello I eruption. This proves that the theory of a single fractionating magma batch is in existence beneath Vulcanello is wrong, as a single fractionating batch of magma could have produced the four sequential products but Vulcanello II must represent replenishment by a less evolved magma batch. Instead, it is likely that Vulcanello is formed as an overflow of the mafic magmatic system beneath La Fossa and is activated during the replenishment of the La Fossa system.

This theory that La Fossa and Vulcanello are linked is supported by the chronostratigraphic geochemistry results. When La Fossa and Vulcanello are erupting at a similar time, the deposits produced at both centres are very similar and so are likely to have come from the same magma chamber. The trace element data in particular indicates that they are from the same source and have undergone similar levels of fractionation. Trace element mantle-normalised profiles of the contemporaneous eruptions of the Palizzi A (La Fossa) and the early Vulcanello I deposits are nearly identical, indicating that they probably came from identical magma batches. The other contemporaneous eruptions of the Upper Pietre Cotte from La Fossa and the Vulcanello III explosive eruption also have near identical mantle-normalised profiles but these show slightly different degrees of fractionation of feldspar. It is likely that the deposits came from identical magma batches but that the Vulcanello magmas experienced slightly more feldspar fractionation.

In conclusion it is likely that La Fossa and Vulcanello are linked, with a longer lived system under La Fossa (cyclical mafic to felsic) and a shorter lived more mafic magma system under Vulcanello.

Zoned phenocrysts are very useful as they can record both temporal and spatial variations in pressure, temperature and volatile content within the magma chamber. Zoned clinopyroxenes (cpxs) were found in five different explosive and effusive deposits on La Fossa (2 units) and Vulcanello (3 units) meaning that they can be used to find out about magma behaviour beneath Vulcanello and, to some extent, La Fossa. The zones are either normal, reverse or oscillatory in nature and consist of between 2 and 5 zones. Unzoned cpxs found within the same deposit as the zoned phenocrysts show similarly large variations in composition.

The EPMA and LA-ICP-MS traverses across the zoned crystals clearly reveal that there are marked and systematic compositional changes between cores and zones and between zones. Two contrasting compositions co-exist: a relatively less fractionated magma composition characterised by Ca-Mg-Cr-Sc rich cores and rims and a relatively fractionated Fe-Ti-V rich magma. Both magma compositions exist as cores or zones around the cores.

Chemical zonation in the cpxs show similar magma dynamics to the temporal variations seen in the La Fossa juvenile clast glass chemistry. The co-existing compositionally distinct magmas at high level within the magma system apparent in the zoned cpxs seen in samples from both Vulcanello and La Fossa supports the theory that the two systems are linked.

## Acknowledgements

There are a large number of people without whom I would never have been able to complete this research. First and foremost I would like to thank my supervisors: Professor Martin Menzies for all his help and support over the years. Thank you also to Dr. Emma Tomlinson for all the help, specifically with the laboratory analysis and to Professor Mauro Rosi for help and advice during all the fieldwork. I also wish to thank Professor Margaret Collinson for always being willing to give helpful advice when I needed it. As well as these people, several of my fellow students have helped me greatly and I wish to thank them, especially Paul Albert, Federico Di Traglia and Marco Pistolesi.

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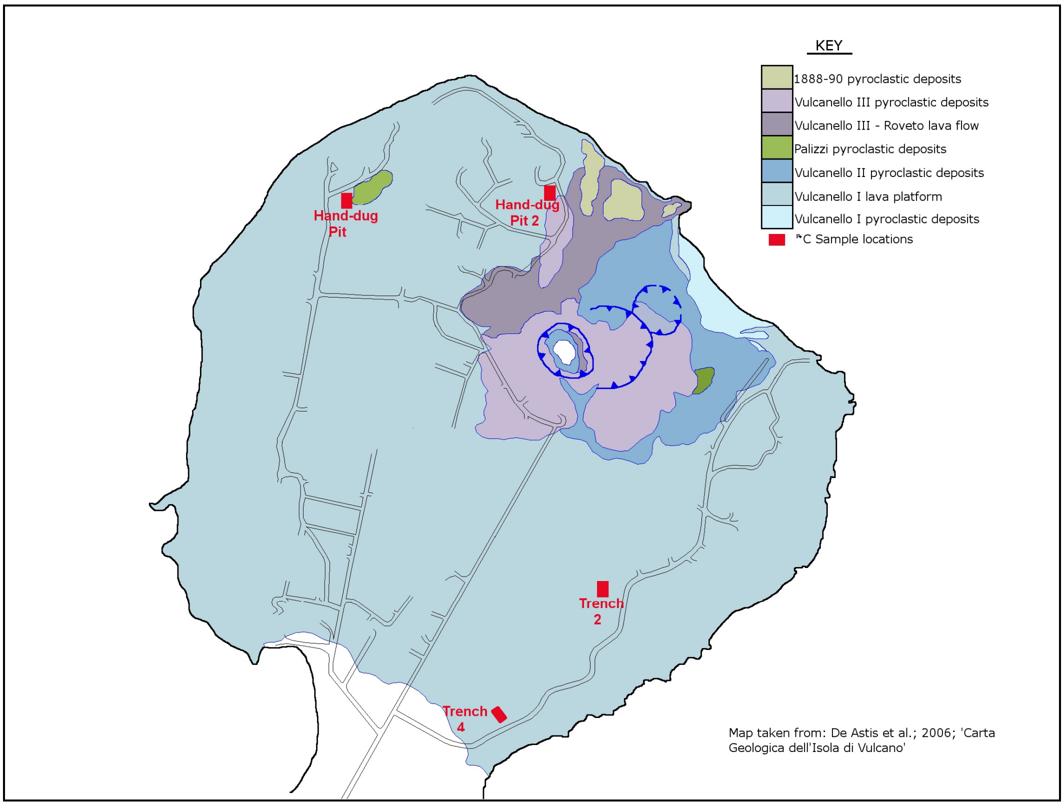
Finally, and most importantly, I wish to thank Sam and my family, particularly my parents, Kate and Michael Todman, for all the financial and emotional support they have given to me. However, without my grandparents, Nancy and Alan Stubbs, I would not have been able to do this research and I wish to dedicate this thesis to them.

# APPENDIX A – Charcoal Collection and $^{14}$C Dating

<u>Charcoal Collection During Fieldwork</u>

Charcoal was sampled for radiocarbon dating on Vulcano in seven trenches. Six samples were from the Commenda Ash layer above the Monte Pilato white marker layer from Lipari and one from below the Pilato marker layer. The charcoal was sent to the Oxford Radiocarbon Accelerator Unit (ORAU) in two batches. Of the first set of three samples to be sent for radiocarbon dating, two of them failed to yield enough organic matter for dating during the pre-treatment phase of the analysis process meaning that just one date was produced. From the second set of samples, three of them produced dates with just one of them failing during the pre-treatment process. The locations of the successfully dated charcoal samples from the Commenda Ash layer (Figure A.1) are all located on Vulcanello.




FigureA.1: Location map of charcoal samples.

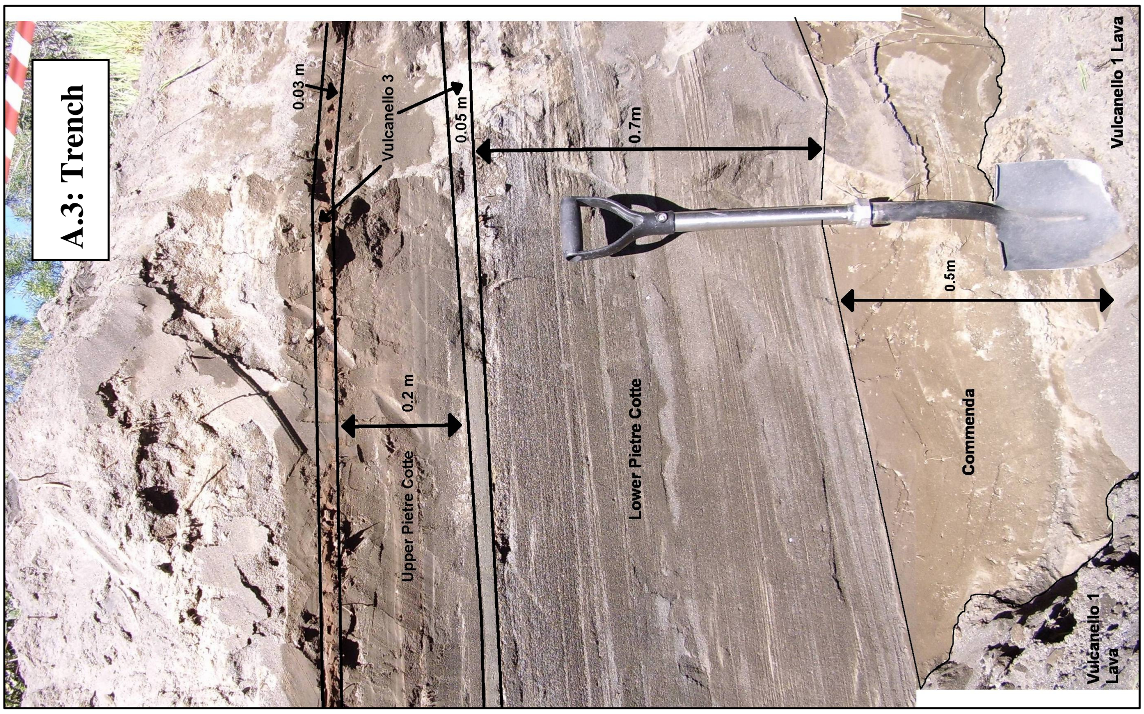
In order to avoid any modern biological contamination from both skin or petroleum products and plastics, at each location the samples were collected using stainless steel tweezers and then placed directly into an aluminium foil packet. Methanol was used to clean the tweezers in between collecting each different sample to avoid any cross-contamination.

Hand-dug Pit 1 (Figure A.2) was located towards the north-west of Vulcanello and the pit was dug to a depth of 0.8m. At the base of the pit was a 0.1m white marker layer of Monte Pilato ash from Lipari overlain by 0.5m of Commenda Ash. The top 0.1m of this ash layer was slightly darker brown and it was here that the small fragments of charcoal were located. This layer was overlain by a further 0.2m of Pietre Cotte Ash.

Trench 2 (Figure A.3) was located to the south-east of Vulcanello and the trench was mechanically dug down to the Vulcanello I lava platform. In this trench the Commenda Ash layer lies directly on top of the lava platform and then is overlain by ash from the Lower Pietre Cotte eruption from La Fossa. This is in turn is overlain by the grey and red ash layers from Vulcanello III which are separated by ash from the Upper Pietre Cotte eruption. The boundary between the Commenda and the Lower Pietre Cotte ashes is clearly defined because the Commenda ash is brown and finer than the slightly coarser grey ash from the Lower Pietre Cotte. The charcoal was found within a thin (about 0.05m) darker brown band towards the top of the Commenda Ash fall deposit.

Figure A.4 shows the north wall of Trench 4, located in the south of Vulcanello. At the base of the trench the Vulcanello lava platform is exposed overlain by a 0.15m reworked layer of ash from the Palizzi eruption on La Fossa. Above this is a distinctive white layer which was thought to be the Pilato marker layer from Lipari. On top of this layer lies the Commenda Ash layer and in this location, several small charcoal fragments were found in the darker brown part of the upper half of this layer. Finally on top of the Commenda Ash layer there are deposits from the Pietre Cotte eruption on La Fossa.

The other hand-dug pit (Hand-dug Pit 2, Figure A5) was located towards the north of the Vulcanello III eruptive centre. The Vulcanello I lava platform was also found at the base of this hand-dug pit, overlain by up to 0.1m of Commenda Ash. In contrast to the other trenches and the hand-dug pit, in Hand-dug Pit 2, the Commenda Ash was directly overlain by deposits from the most recent eruption of Vulcanello, Vulcanello III. The charcoal found at this location was from a similar stratigraphic height as to the other successfully dated samples and was collected from the top 5cm of the Commenda Ash layer.



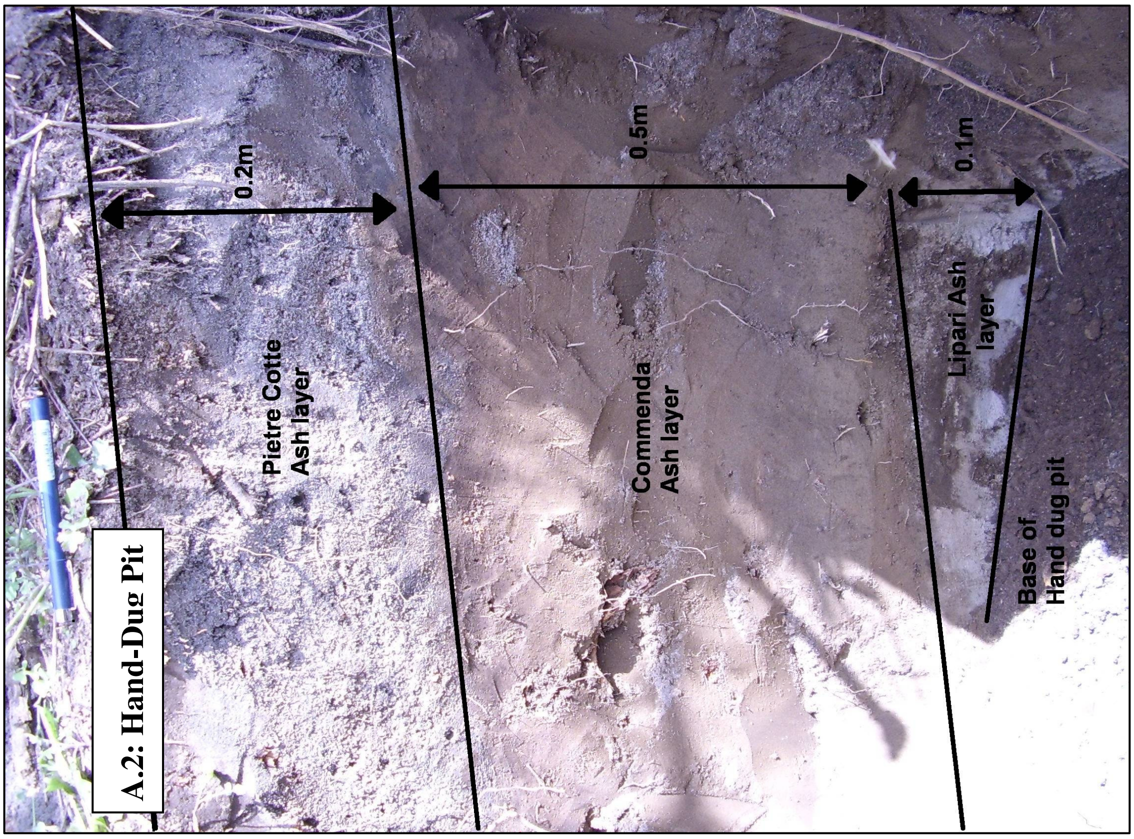
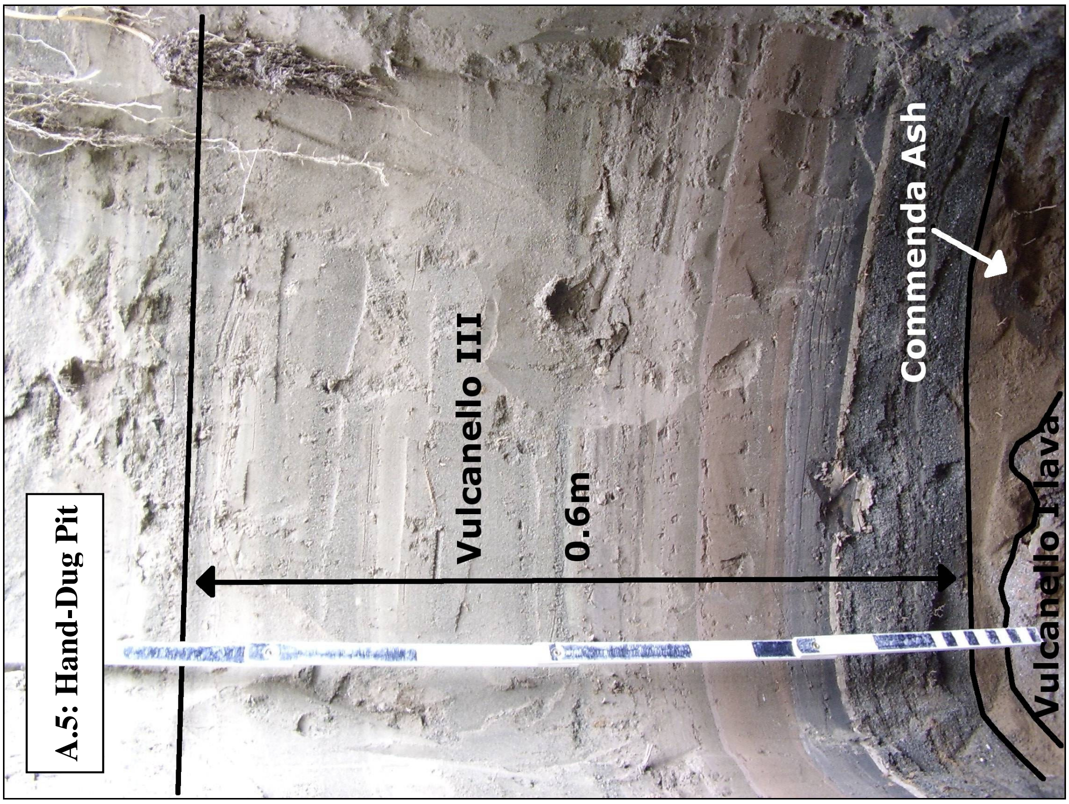




Figure A.2: Hand-Dug Pit 1 – Charcoal found within the Commenda Ash layer.

Figure A.3: Trench 2 – Charcoal found at towards the top of the Commenda Ash layer.



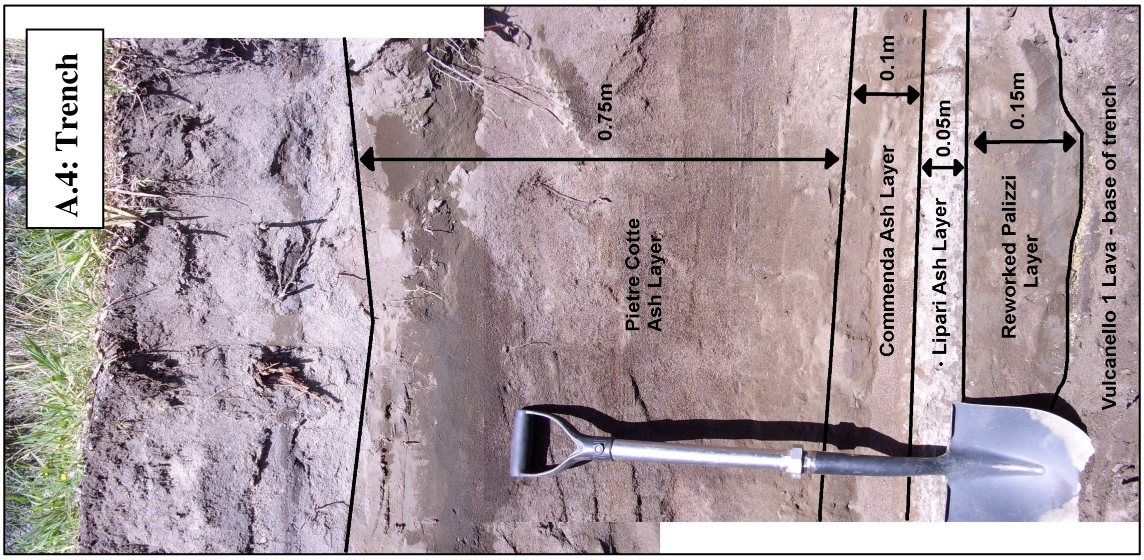




Figure A.4: Trench 4 – Charcoal found at towards the top of the Commenda Ash layer.

Figure A.5: Hand-Dug Pit 2 – Charcoal found at the top of the Commenda Ash layer.

<u>Radiocarbon Dating Background Information</u>

Radiocarbon dating is a radiometric dating method which relies on measuring the decay rate of the naturally occurring isotope of carbon, $^{14}C$. Organic matter incorporates $^{14}C$ during its life and after the plant dies, then the $^{14}C$ isotope gradually decays at a fixed exponential rate (through radioactive β-decay) with a half-life of

5,730±40 years (Libby, 1970), although currently a half-life of 5568 years is used during measurements by radiocarbon dating laboratories (Bronk-Ramsey 2010 pers comm.). Radiocarbon dating also relies on the assumption that all $^{14}C$ reservoirs are constant throughout time (Stuiver & Polach, 1977). The sample to be dated has its residual radioactivity carefully measured and this value is compared to the radioactivity present in both modern and background samples (Stuiver & Polach, 1977). This radiocarbon measurement is also known as a conventional radiocarbon age (CRA) obtained following a specific set of parameters and is usually recorded as a raw (uncalibrated) age in years BP as outlined by Stuiver & Polach, (1977).

The following equation is used by the radiocarbon dating laboratories to calculate the CRA of a sample:

$$t=-8033 \ln(Asn/Aon)$$

In the above equation, 't' is the calculated radiocarbon age and '-8033' is used as it represents the mean lifetime of 14C. 'Asn' is the radioactivity of the sample in counts per minute and 'Aon' is the similar activity of a modern standard, (Stuiver and Polach, 1977).

Calibration to give calendar years from the uncalibrated (raw) radiocarbon age (BP) is theoretically very simple and can be done using software such as the 'Oxcal computer program (v4.0)' created by C. Bronk-Ramsey, using the 'INTCAL09' dataset. It is done by comparing the measured radiocarbon concentration of the sample to the radiocarbon concentration of a tree-ring sample of known age. (pers com ORAU). A compilation of tree-rings has been created to produce a radiocarbon concentration curve going back 11,000 years (ORAU). Although as both radiocarbon measurements on tree-rings and unknown samples have a limited precision, there is often a range of possible calendar years for each CRA.

Dating at the Oxford Radiocarbon Accelerator Unit

The radiocarbon dating of the charcoal samples was carried out by the Oxford Radiocarbon Accelerator Unit (ORAU). The dates are in uncalibrated radiocarbon years BP, calculated by using the laboratory accepted half life of 5568 years (Bronk-Ramsey 2010 pers comm). All the samples underwent pre-treatment processes meaning that the samples were placed in dilute HCL (10% conc.) in order to remove any absorbed carbonates for example from percolating groundwater and it was during this stage that three of them failed. The failure was due to the sample having no or a very low yield of carbon that could be used for the dating process (pers comm. Bronk-Ramsey).

As well as the isotope $^{14}C$, the $\delta^{13}C$ values were also measured as they can sometimes provide helpful information about the environment from which the samples come (pers comm. ORAU). These values were measured using an Accelerator Mass Spectrometer (AMS) and have been corrected for isotopic fractionation. The quoted $\delta^{13}C$ values are measured independently on a stable isotope mass spectrometer (to ±0:3 per mil relative to VPDB).

The uncalibrated dates were then entered into the 'Oxcal computer program (v4.0)' of C. Bronk Ramsey, using the `INTCAL09' dataset (Radiocarbon 51 (4), 2009) and these produced the calibration plots shown in Figure 4.3. The plots show how the uncalibrated date, which is also known as the radiocarbon determination (in BP), can be converted into a calibrated date. For each plot the left-hand axis shows the laboratory-provided radiocarbon concentration in years BP and the bottom axis gives an age in calendar years. The blue line shows the standard radiocarbon concentrations for the tree rings to within ± 1 standard deviation which are then used to help correlate the radiocarbon in the new samples. The red curve on the left-hand axis shows the radiocarbon concentration in each of the new samples and the grey histogram on the bottom axis show the possible ages that the new sample could be. The more likely a particular age is, the higher the histogram peak is, however, usually the age of the sample is given as a range of dates which have a 95.4% probability that the sample falls within them (pers comm. ORAU).

## References

Libby, W. F. 1970, "Radiocarbon Dating", *Phil. Trans. Roy. Soc. Lond. A*, vol. **269**, pp. 1-10

Stuiver, M. and Polach, H.A. 1977. "Discussion: Reporting of 14C data", *Radiocarbon* vol.**19**: 355-63.

# APPENDIX B – Rock Sample Locations and Descriptions

| ERUPTIVE UNIT | SAMPLE NAME | latitude (E) | longitude (N) | elevation (m) |
|---|---|---|---|---|
| 1888-90 | AT Location13 | 14.56.541 | 38.24.339 | 31 |
| Upper Pietre Cotte | Stop 90cb | 14.57.217 | 38.24.087 | 173 |
| Upper Pietre Cotte | Stop 90ca | 14.57.217 | 38.24.087 | 173 |
| Upper Pietre Cotte | Stop 90c2 | 14.57.217 | 38.24.087 | 173 |
| Upper Pietre Cotte | Stop 90b1b | 14.57.217 | 38.24.087 | 173 |
| Upper Pietre Cotte | Stop90b1a | 14.57.217 | 38.24.087 | 173 |
| Pietre Cotte | AT Location1 | 14.58.044 | 38.23.580 | 199 |
| Pietre Cotte | lava PC | 14.57.279 | 38.24.349 | 67 |
| Lower Pietre Cotte | LPC1 | 14.57.560 | 38.23.589 | 231 |
| Lower Pietre Cotte | LPC2 | 14.57.560 | 38.23.589 | 231 |
| Commenda | STOP 38e | 14.57.440 | 38.23.443 | 131 |
| Commenda | CA1-5 | 14.57.184 | 38.23.481 | 88 |
| Commenda | AT Location14 | 14.56.541 | 38.14.390 | 31 |
| M. Pilato, Lipari | AT Location15 | 14.57.010 | 38.23.496 | 95 |
| M. Pilato, Lipari | 14PLB | 14.57.437 | 38.23.500 | 121 |
| Palizzi | RVULC 07-9 | 14.57.439 | 38.23.440 | 135 |
| Palizzi | RVULC 07-54 | 14.57.235 | 38.23.678 | 150 |
| Palizzi | RVULC 07-24 | 14.58.146 | 38.24.290 | 157 |
| Palizzi | RVULC 07-41 | 14.58.146 | 38.24.290 | 157 |
| Palizzi | STOP 33 10-15 | 14.58.022 | 38.23.468 | 135 |
| Palizzi | STOP 33 40-60 | 14.58.022 | 38.23.468 | 135 |
| Palizzi | STOP 33 90-110 | 14.58.022 | 38.23.468 | 135 |
| Palizzi | STOP 33 110-135 | 14.58.022 | 38.23.468 | 135 |
| Palizzi | STOP 32B | 14.58.022 | 38.23.468 | 135 |
| Palizzi | RVULC 07-46 | 14.57.461 | 38.23.484 | 118 |
| Palizzi | STOP 77 i | 14.57.461 | 38.23.484 | 118 |
| Palizzi | STOP 77 tot | 14.57.461 | 38.23.484 | 118 |
| Palizzi | STOP 77 e | 14.57.461 | 38.23.484 | 118 |
| Palizzi | STOP 77 b | 14.57.461 | 38.23.484 | 118 |

Table B.1: Locations of the samples from La Fossa

| ERUPTIVE UNIT | SAMPLE NAME | latitude (E) | longitude (N) | elevation (m) |
|---|---|---|---|---|
| Vulcanello 3 | AT Location2 | 14.57.423 | 38.23.348 | 71 |
| Vulcanello 3 | AT Location12 | 14.57.473 | 38.25.465 | 29 |
| Vulcanello 3 | VLS3 | 14.57.469 | 38.25.433 | 44 |
| Lower Pietre Cotte | Vol c Tr2 | 14.57.470 | 38.35.199 | 24 |
| Lower Pietre Cotte | Vol d Tr2 | 14.57.470 | 38.35.199 | 24 |
| M. Pilato, Lipari | Stop86 | 14.57.128 | 38.35.368 | 11 |
| Palizzi | AT Location17 | 14,57.138 | 38.25.194 | 6 |
| Vulcanello 2 | AT Location3 | 14.58.040 | 38.25.352 | 11 |
| Vulcanello Platform | AT Location16 | 14.57.473 | 38.25.465 | 29 |
| Vulcanello 1 | AT Location8 | 14.57.581 | 38.25.348 | 35 |
| Vulcanello 1 | AT Location9 | 14.57.581 | 38.25.348 | 35 |
| Vulcanello 1 | AT Location6 | 14.58.022 | 38.25.365 | 11 |
| Vulcanello 1 | AT Location5 | 14.58.022 | 38.25.365 | 11 |
| Vulcanello 1 | AT Location7 | 14.58.022 | 38.25.365 | 11 |
| Vulcanello 1 | AT Location4 | 14.58.022 | 38.25.365 | 11 |

Table B.2: Locations of the samples collected from Vulcanello

| SAMPLE NAME | SAMPLE TYPE | BRIEF SAMPLE DESCRIPTION & PHENOCRYSTS |
|---|---|---|
| AT Location13 | tephra | coarse ash & lapilli, few lava lithics, no visible phenocrysts, but microcrysts of abundant cpx, some feld & few ol |
| Stop 90cb | pumice | coarse ash & lapilli, highly stretched pumices, v. few lava lithics, no visible phenocrysts, but microcrysts of some cpx &feld |
| Stop 90ca | pumice | coarse ash & lapilli, highly stretched pumices, v. few lava lithics, no visible phenocrysts, but microcrysts of some cpx &feld |
| Stop 90c2 | pumice | coarse ash & lapilli, highly stretched pumices, v. few lava lithics, no visible phenocrysts, but microcrysts of some cpx &feld |
| Stop 90b1b | pumice | coarse ash & lapilli, highly stretched pumices, v. few lava lithics, no visible phenocrysts, but microcrysts of some cpx &feld |
| Stop90b1a | pumice | coarse ash & lapilli, highly stretched pumices, v. few lava lithics, no visible phenocrysts, but microcrysts of some cpx &feld |
| AT Location1 | pumice | banded pumice, no visible phenocrysts, microcrysts of some cpx & feld, few ol |
| lava PC | lava (Pietre Cotte) | visible phenocrysts of K-feldspar, microcrysts of some cpx & feld, few ol |
| LPC1 | pumice | obsidian & pumice clasts, lots of microcrysts of cpx, few of feld & ol |
| LPC2 | pumice | obsidian & pumice clasts, lots of microcrysts of cpx, few of feld & ol |
| STOP 38e | lava (Commenda) | visible phenocrysts of K-feldspar & pyroxene, few microcrysts of cpx, feld & ol |
| CA1-5 | tephra | fine-coarse varicoloured ash, microcrysts of abundant feld, few cpx |
| AT Location14 | tephra | coarse ash & lapilli, no visible phenocrysts but abundant feld microcrysts |
| AT Location15 | pumice | white pumice with few obsidian clasts |
| 14PLB | pumice | white pumice with few obsidian clasts |
| RVULC 07-9 | lava (Palizzi) | visible phenocrysts of K-feldspar, plagioclase & pyroxene, microcrysts of abundant cpx & feld |
| RVULC 07-54 | lava (Campo Sportivo) | visible phenocrysts of K-feldspar, plagioclase & pyroxene, microcrysts of abundant cpx |
| RVULC 07-24 | lava (Punte Nere) | visible phenocrysts of K-feldspar, plagioclase & pyroxene, microcrysts of abundant cpx, few feld & ol |
| RVULC 07-41 | lava (Punte Nere) | visible phenocrysts of K-feldspar, plagioclase & pyroxene, microcrysts of abundant cpx & feld |
| STOP 33 10-15 | pumice | lapilli-sized pumices with few obsidian clasts & lava lithics, but microcrysts of cpx & feld |
| STOP 33 40-60 | pumice | lapilli-sized pumices with few obsidian clasts & lava lithics, but microcrysts of cpx & feld |
| STOP 33 90-110 | pumice | lapilli-sized pumices with few obsidian clasts & lava lithics, but microcrysts of cpx & feld |
| STOP 33 110-135 | pumice | lapilli-sized pumices with few obsidian clasts & lava lithics, but microcrysts of cpx & feld |
| STOP 32B | pumice | lapilli-sized pumices with few obsidian clasts & lava lithics, but microcrysts of cpx & feld |
| RVULC 07-46 | pumice | coarse ash-lapilli, white stretched pumices, pyroxene phenocrysts. Microcrysts of abundant cpx, few feld |
| STOP 77 i | tephra | fine - coarse ash & scoria, no visible phenocrysts, but abundant microcrysts of cpx & feld, few ol |
| STOP 77 tot | tephra | fine - coarse ash & scoria, no visible phenocrysts, but abundant microcrysts of cpx & feld, few ol |
| STOP 77 e | tephra | fine - coarse ash & scoria, no visible phenocrysts, but abundant microcrysts of cpx & feld, few ol |
| STOP 77 b | tephra | fine - coarse ash & scoria, no visible phenocrysts, but abundant microcrysts of cpx & feld, few ol |

Table B.3: Description of the samples from La Fossa

| SAMPLE NAME | SAMPLE TYPE | BRIEF SAMPLE DESCRIPTION & PHENOCRYSTS |
|---|---|---|
| AT Location2 | pumice | brown pumice clasts with few visible pyroxene & feldspar phenocrysts. Abundant microcrysts of cpx, some feld, few ol |
| AT Location12 | lava (Roveto) | abundant visible pyroxene, feldspars & olivine phenocrysts and microcrysts |
| VLS3 | lava (Roveto) | abundant visible pyroxene, feldspars & olivine phenocrysts and microcrysts |
| Vol c Tr2 | tephra | fine-coarse ash & lapilli, no visible phenocrysts, but microcrysts of abundant cpx, few feld& ol |
| Vol d Tr2 | tephra | fine-coarse ash & lapilli, no visible phenocrysts, but microcrysts of abundant cpx, few feld& ol |
| Stop86 | pumice | white pumice with few obsidian clasts |
| AT Location17 | pumice | coarse ash-lapilli, white stretched pumices, visible pyroxene phenocrysts, microcrysts of abundant cpx, few feld & ol |
| AT Location3 | pumice | golden, elongated pumices, no visible phenocrysts, but microcrysts of abundant cpx, few feld & ol |
| AT Location16 | lava | few plagioclase & pyroxenes visible phenocrysts. Abundant cpx microcrysts, few feld & ol |
| AT Location8 | tephra | black lapilli sized scoria with red lithics, microcrysts of abundant cpx, few feld |
| AT Location9 | tephra | black lapilli sized scoria with red lithics, microcrysts of abundant cpx, few feld |
| AT Location6 | tephra | grey lapilli sized scoria, no visible phenocrysts but microcrysts of abundant cpx, few feld & ol |
| AT Location5 | tephra | grey lapilli sized scoria, no visible phenocrysts but microcrysts of abundant cpx, few feld & ol |
| AT Location7 | tephra | black-grey scoria, microcrysts of abundant cpx, few feld & ol |
| AT Location4 | tephra | grey lapilli sized scoria, no visible phenocrysts but microcrysts of abundant cpx, few feld |

Table B.4: Description of the samples collected from Vulcanello

## APPENDIX C – ICP-AES & ICP-MS Preparation, Data and Standards

Sample Preparation and Analysis Methodology

- Samples cleaned manually, then in an ultrasonic bath, before being dried over night at 50°C.
- Samples then crushed lightly with a hammer before being split into two.
- 15 – 20 shards were mounted on a glass slide and put aside for use later.
- The rest was crushed further to form a fine powder using a TEMA.
- The powdered samples along with external standards (AVG-2 & BCR-2) and in-house calibration standards (KC10, KC11, KC12, KC14 & RH21) were weighed to 0.2g ± 0.0005g, placed into a graphite crucible and mixed 1g ± 0.002 $LiBO_2$ + Ga (Lithium Metaborate and Gallium) flux.
- Graphite crucibles were heated in the furnace to 950°C. for 25mins.
- 200ml of 5% nitric acid was placed in a polythene beaker together with a PTFE stirring bean, the crucibles were removed from the furnace and the fusion mixture added to the beaker.
- The beakers were placed on a magnetic stirrer to mix until the fusion material had dissolved.
- Removing any surface graphite from the crucibles, the fusion and acid mixture was poured into 10ml specimen tubes.
- The samples were used directly for ICP-AES analysis, but diluted 1:4 for ICP-MS analysis.
-

| | |
|---|---|
| **ICP Settings** | |
| Frequency | 40 Hz |
| Power | 1.3 kW |
| Observation Height | 13mm |
| **Plasma Parameters** | |
| Purge | Normal |
| Aerosol Type | Wet |
| Equilibration Delay | 15 sec |
| Plasma Gas Flow Rate | 15 $Lmin^{-1}$ |
| Auxiliary Gas Flow Rate | 0.5 $Lmin^{-1}$ |
| Nebulizer Gas Flow Rate | 0.8 $Lmin^{-1}$ |
| **Peristaltic Pump Parameters** | |
| Sample Flow Rate | 1.5 $mLmin^{-1}$ |
| **Data Collection** | |
| Program | Li fusions |
| Replicates | 5 |
| Read time | 5 sec |
| Resolution | Normal |
| Peak Height (elements) | Height |
| Peak Area (elements) | None |

| | |
|---|---|
| Calibration method | Direct |
| Calibration standards | KC10; KC11; KC12; KC14 & in house ref |
| External Standards Used | AVG-2 & BCR-2 |

Ga used as an internal standard for Si; Mg; Al; Ca; Fe.

ICP-AES and ICP-MS Data

| | | S90cb, ca & b2 (combined) | AT1 | LPC1 | LPC2 | CA1-5 | S38e | RVULC 07-9 | RVULC 07-54 | RVULC 07-24 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte** | **unit** | **aggregated tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **bulk lava** | **bulk lava** | **bulk lava** | **bulk lava** |
| **SiO2** | **wt%** | 56.6 | 57.9 | 55.2 | 54.4 | 60.5 | 71.0 | 58.0 | 58.8 | 58.5 |
| **Al2O3** | **wt%** | 15.9 | 15.2 | 16.1 | 16.2 | 14.8 | 13.4 | 16.0 | 15.8 | 16.2 |
| **FeOt** | **wt%** | 7.6 | 6.4 | 8.2 | 7.8 | 5.6 | 2.9 | 6.1 | 6.1 | 6.5 |
| **MgO** | **wt%** | 2.88 | 2.74 | 3.74 | 3.19 | 1.24 | 0.49 | 2.00 | 1.88 | 2.25 |
| **CaO** | **wt%** | 4.90 | 5.15 | 6.71 | 6.10 | 2.72 | 1.52 | 4.33 | 4.07 | 4.63 |
| **Na2O** | **wt%** | 4.01 | 3.74 | 3.98 | 4.03 | 3.39 | 4.14 | 4.36 | 3.98 | 4.36 |
| **K2O** | **wt%** | 5.78 | 5.14 | 5.57 | 5.70 | 5.51 | 5.12 | 6.23 | 5.95 | 6.23 |
| **TiO2** | **wt%** | 0.58 | 0.45 | 0.63 | 0.61 | 0.44 | 0.16 | 0.49 | 0.46 | 0.52 |
| **P2O5** | **wt%** | 0.43 | 0.29 | 0.42 | 0.43 | 0.25 | 0.08 | 0.30 | 0.27 | 0.32 |
| **MnO** | **wt%** | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| **Total** | **wt%** | 98.8 | 97.2 | 100.6 | 98.7 | 94.6 | 98.9 | 97.9 | 97.4 | 99.6 |
| **Alkali** | **(K+Na)** | 9.8 | 8.9 | 9.6 | 9.7 | 8.9 | 9.3 | 10.6 | 9.9 | 10.6 |
| **Ba** | **ppm** | 982 | 703 | 998 | 1001 | 814 | 184 | 814 | 726 | 828 |
| **Sr** | **ppm** | 855 | 816 | 1124 | 1125 | 822 | 164 | 856 | 746 | 923 |
| **Y** | **ppm** | | 32 | 30 | 30 | | | 31 | 31 | 31 |
| **Zr** | **ppm** | 210 | 205 | 203 | 202 | 199 | 185 | 271 | 277 | 281 |
| **Co** | **ppm** | 18 | 9 | 20 | 16 | 9 | 5 | 12 | 11 | 13 |
| **Cr** | **ppm** | 42 | 31 | 53 | 40 | 17 | 7 | 19 | 16 | 18 |
| **Cu** | **ppm** | 128 | 72 | 137 | 106 | 187 | 29 | 99 | 86 | 68 |
| **Ni** | **ppm** | 14 | 11 | 16 | 14 | 4 | 2 | 7 | 9 | 4 |
| **Sc** | **ppm** | 13 | 8 | 16 | 13 | 10 | 4 | 8 | 8 | 9 |
| **V** | **ppm** | 146 | 114 | 163 | 157 | 109 | 26 | 110 | 104 | 121 |
| **Li** | **ppm** | 52.40 | | | | 42.80 | 82.60 | | | |
| **Zn** | **ppm** | 103.58 | | | | 71.36 | 70.50 | | | |
| **Rb** | **ppm** | 208 | 195 | 170 | 166 | 210 | 295 | 205 | 211 | 199 |
| **Nb** | **ppm** | 25 | 23 | 18 | 21 | 28 | 36 | 24 | 26 | 25 |
| **Cs** | **ppm** | 9.8 | 11.3 | 8.3 | 8.5 | 10.2 | 16.5 | 11.1 | 11.2 | 10.6 |
| **La** | **ppm** | 76 | 75 | 70 | 76 | 69 | 72 | 88 | 84 | 83 |
| **Ce** | **ppm** | 128 | 124 | 115 | 128 | 111 | 128 | 141 | 136 | 136 |
| **Pr** | **ppm** | 13.2 | 12.5 | 11.7 | 12.9 | 10.7 | 13.1 | 13.5 | 13.3 | 13.5 |
| **Nd** | **ppm** | 51 | 54 | 52 | 57 | 39 | 48 | 57 | 54 | 56 |
| **Sm** | **ppm** | 8.6 | 9.1 | 9.8 | 10.4 | 6.2 | 8.8 | 9.2 | 9.3 | 9.9 |
| **Eu** | **ppm** | 2.1 | 1.2 | 1.5 | 1.7 | 1.5 | 0.4 | 1.2 | 1.2 | 1.2 |
| **Gd** | **ppm** | 6.3 | 7.3 | 7.5 | 7.9 | 6.0 | 6.8 | 7.5 | 7.0 | 7.6 |
| **Dy** | **ppm** | 4.4 | 5.1 | 4.7 | 4.5 | 4.4 | 6.3 | 4.6 | 4.8 | 4.6 |
| **Ho** | **ppm** | 0.81 | 0.92 | 0.89 | 0.89 | 0.72 | 1.24 | 0.91 | 0.93 | 0.93 |
| **Er** | **ppm** | 2.51 | 2.73 | 2.42 | 3.22 | 2.34 | 4.02 | 2.46 | 2.58 | 2.58 |
| **Yb** | **ppm** | 2.2 | 2.6 | 2.2 | 2.2 | 2.2 | 4.0 | 2.5 | 2.5 | 2.6 |
| **Lu** | **ppm** | 0.39 | 0.35 | 0.31 | 0.28 | 0.39 | 0.62 | 0.35 | 0.37 | 0.35 |
| **Hf** | **ppm** | 5.5 | 5.9 | 4.8 | 4.9 | 5.6 | 6.6 | 6.6 | 7.1 | 6.3 |
| **Ta** | **ppm** | 1.50 | 1.42 | 1.14 | 1.10 | 1.69 | 2.40 | 1.39 | 1.44 | 1.38 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Tl | ppm | | 0.45 | 0.33 | 0.42 | | | 0.45 | 0.63 | 0.70 |
| Pb | ppm | 29 | 33 | 31 | 40 | 34 | 34 | 45 | 39 | 47 |
| Th | ppm | 32.8 | 36.9 | 27.9 | 28.5 | 36.3 | 50.6 | 39.3 | 39.1 | 37.5 |
| U | ppm | 8.97 | 9.94 | 7.87 | 8.38 | 9.48 | 14.02 | 10.19 | 10.47 | 10.32 |

| | | **RVULC 07-41** | **STOP 33 10-15** | **STOP 33 40-60** | **STOP 33 90-110** | **STOP 33 110-135** | **RVULC 07-46** | **AT2** | **AT3** | **AT8** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte** | **unit** | **bulk lava** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** |
| **SiO2** | **wt%** | 57.2 | 57.6 | 57.9 | 58.6 | 59.7 | 64.2 | 57.0 | 51.8 | 51.7 |
| **Al2O3** | **wt%** | 16.2 | 18.2 | 18.3 | 18.5 | 18.6 | 13.8 | 16.2 | 16.4 | 15.3 |
| **FeOt** | **wt%** | 7.0 | 5.1 | 4.8 | 4.9 | 4.7 | 3.1 | 7.2 | 8.6 | 9.1 |
| **MgO** | **wt%** | 2.56 | 1.09 | 1.07 | 1.11 | 1.05 | 1.22 | 3.15 | 3.71 | 4.96 |
| **CaO** | **wt%** | 5.17 | 2.57 | 2.64 | 2.60 | 2.65 | 2.09 | 5.84 | 6.56 | 8.73 |
| **Na2O** | **wt%** | 4.13 | 4.02 | 4.20 | 4.31 | 4.55 | 3.10 | 4.15 | 3.61 | 3.66 |
| **K2O** | **wt%** | 6.03 | 6.81 | 7.29 | 7.44 | 7.81 | 6.25 | 5.52 | 5.10 | 4.94 |
| **TiO2** | **wt%** | 0.54 | 0.55 | 0.58 | 0.62 | 0.61 | 0.22 | 0.55 | 0.66 | 0.67 |
| **P2O5** | **wt%** | 0.35 | 0.26 | 0.25 | 0.28 | 0.25 | 0.09 | 0.37 | 0.45 | 0.42 |
| **MnO** | **wt%** | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 |
| **Total** | **wt%** | 99.2 | 96.2 | 97.1 | 98.5 | 100.1 | 94.3 | 100.1 | 97.0 | 99.6 |
| **Alkali** | **(K+Na)** | 10.2 | 10.8 | 11.5 | 11.8 | 12.4 | 9.4 | 9.7 | 8.7 | 8.6 |
| **Ba** | **ppm** | 887 | 2187 | 2098 | 2141 | 1825 | 253 | 899 | 1070 | 1038 |
| **Sr** | **ppm** | 1026 | 1037 | 1038 | 1039 | 993 | 192 | 1021 | 1024 | 1273 |
| **Y** | **ppm** | 30 | 28 | 29 | 30 | 30 | 39 | 29 | 27 | 26 |
| **Zr** | **ppm** | 251 | 192 | 203 | 215 | 220 | 244 | 210 | 174 | 154 |
| **Co** | **ppm** | 18 | 6 | 7 | 7 | 8 | 4 | 15 | 23 | 24 |
| **Cr** | **ppm** | 24 | 0 | 0 | 0 | 0 | 4 | 33 | 52 | 63 |
| **Cu** | **ppm** | 163 | 103 | 116 | 115 | 96 | 59 | 78 | 250 | 127 |
| **Ni** | **ppm** | 13 | 0 | 0 | 1 | 0 | 3 | 9 | 10 | 18 |
| **Sc** | **ppm** | 10 | 4 | 4 | 4 | 4 | 4 | 10 | 15 | 21 |
| **V** | **ppm** | 135 | 68 | 67 | 70 | 65 | 37 | 140 | 180 | 204 |
| **Li** | **ppm** | | | | | | | | | |
| **Zn** | **ppm** | | | | | | | | | |
| **Rb** | **ppm** | 189 | 203 | 205 | 211 | 218 | 240 | 181 | 157 | 140 |
| **Nb** | **ppm** | 23 | 24 | 24 | 25 | 26 | 31 | 23 | 20 | 17 |
| **Cs** | **ppm** | 9.5 | 9.6 | 9.3 | 9.5 | 9.7 | 14.2 | 8.9 | 7.7 | 6.3 |
| **La** | **ppm** | 81 | 73 | 69 | 72 | 74 | 87 | 73 | 68 | 63 |
| **Ce** | **ppm** | 132 | 116 | 112 | 115 | 117 | 143 | 122 | 112 | 105 |
| **Pr** | **ppm** | 13.0 | 11.3 | 11.2 | 11.5 | 11.5 | 13.8 | 12.2 | 11.6 | 10.8 |
| **Nd** | **ppm** | 56 | 48 | 47 | 48 | 49 | 56 | 52 | 51 | 51 |
| **Sm** | **ppm** | 9.8 | 8.7 | 8.0 | 8.7 | 8.4 | 9.8 | 9.2 | 9.3 | 9.2 |
| **Eu** | **ppm** | 1.4 | 1.6 | 1.6 | 1.6 | 1.5 | 0.5 | 1.3 | 1.7 | 1.8 |
| **Gd** | **ppm** | 7.5 | 6.9 | 6.6 | 7.4 | 6.8 | 8.0 | 7.0 | 7.2 | 7.3 |
| **Dy** | **ppm** | 4.5 | 4.2 | 4.3 | 4.6 | 4.3 | 5.8 | 4.5 | 4.3 | 4.2 |
| **Ho** | **ppm** | 0.92 | 0.86 | 0.84 | 0.95 | 0.83 | 1.15 | 0.90 | 0.79 | 0.79 |
| **Er** | **ppm** | 2.46 | 2.32 | 2.29 | 2.53 | 2.29 | 3.53 | 2.45 | 2.18 | 2.13 |
| **Yb** | **ppm** | 2.3 | 2.2 | 2.1 | 2.5 | 2.1 | 3.2 | 2.2 | 1.9 | 1.7 |
| **Lu** | **ppm** | 0.32 | 0.29 | 0.29 | 0.36 | 0.27 | 0.46 | 0.32 | 0.25 | 0.25 |
| **Hf** | **ppm** | 6.1 | 4.6 | 4.8 | 5.0 | 5.1 | 7.0 | 5.5 | 4.3 | 4.0 |
| **Ta** | **ppm** | 1.30 | 1.23 | 1.22 | 1.33 | 1.31 | 1.93 | 1.27 | 1.03 | 0.90 |
| **Tl** | **ppm** | 0.43 | 0.86 | 0.77 | 0.78 | 0.62 | 0.63 | 0.44 | 0.78 | 0.36 |
| **Pb** | **ppm** | 42 | 39 | 43 | 42 | 44 | 45 | 32 | 36 | 30 |
| **Th** | **ppm** | 35.8 | 30.5 | 29.6 | 31.3 | 31.4 | 50.6 | 33.4 | 26.6 | 22.4 |
| **U** | **ppm** | 9.47 | 8.65 | 8.42 | 8.68 | 8.93 | 12.90 | 8.62 | 7.26 | 6.04 |

| | | AT9 | AT6 | AT5 | AT7 | AT4 | AT10 | AT11 |
|---|---|---|---|---|---|---|---|---|
| **Analyte** | **unit** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** | **agg. tephra** |
| **SiO2** | **wt%** | 51.8 | 53.1 | 51.9 | 51.8 | 52.5 | 67.4 | 70.0 |
| **Al2O3** | **wt%** | 15.1 | 16.1 | 15.4 | 15.3 | 16.0 | 13.1 | 13.3 |
| **FeOt** | **wt%** | 9.4 | 8.7 | 8.9 | 9.2 | 8.8 | 3.2 | 2.4 |
| **MgO** | **wt%** | 5.01 | 3.81 | 4.39 | 4.67 | 4.10 | 1.18 | 0.26 |
| **CaO** | **wt%** | 8.73 | 6.92 | 7.88 | 8.17 | 7.59 | 2.08 | 1.23 |
| **Na2O** | **wt%** | 3.75 | 4.06 | 4.00 | 3.65 | 3.05 | 3.37 | 3.82 |
| **K2O** | **wt%** | 5.01 | 5.66 | 5.16 | 4.98 | 5.54 | 4.76 | 5.11 |
| **TiO2** | **wt%** | 0.70 | 0.66 | 0.68 | 0.67 | 0.68 | 0.19 | 0.15 |
| **P2O5** | **wt%** | 0.44 | 0.45 | 0.46 | 0.43 | 0.46 | 0.04 | 0.03 |
| **MnO** | **wt%** | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 |
| **Total** | **wt%** | 100.1 | 99.6 | 99.0 | 99.1 | 98.8 | 95.4 | 96.4 |
| **Alkali** | **(K+Na)** | 8.8 | 9.7 | 9.2 | 8.6 | 8.6 | 8.1 | 8.9 |
| **Ba** | **ppm** | 1059 | 1126 | 1106 | 1039 | 1127 | 104 | 103 |
| **Sr** | **ppm** | 1283 | 1179 | 1243 | 1213 | 1294 | 109 | 107 |
| **Y** | **ppm** | 26 | 27 | 27 | 27 | 26 | 41 | 42 |
| **Zr** | **ppm** | 157 | 174 | 167 | 157 | 166 | 156 | 167 |
| **Co** | **ppm** | 24 | 20 | 20 | 20 | 19 | 4 | 0 |
| **Cr** | **ppm** | 69 | 36 | 39 | 46 | 35 | 37 | 1 |
| **Cu** | **ppm** | 136 | 172 | 130 | 111 | 130 | 31 | 19 |
| **Ni** | **ppm** | 23 | 20 | 14 | 17 | 15 | 7 | 1 |
| **Sc** | **ppm** | 22 | 14 | 18 | 18 | 16 | 6 | 3 |
| **V** | **ppm** | 213 | 190 | 201 | 202 | 198 | 51 | 19 |
| **Li** | **ppm** | | | | | | | |
| **Zn** | **ppm** | | | | | | | |
| **Rb** | **ppm** | 140 | 164 | 145 | 147 | 154 | 253 | 229 |
| **Nb** | **ppm** | 17 | 21 | 19 | 17 | 19 | 29 | 26 |
| **Cs** | **ppm** | 6.4 | 7.5 | 7.1 | 6.8 | 6.9 | 14.4 | 13.1 |
| **La** | **ppm** | 63 | 71 | 67 | 66 | 67 | 56 | 52 |
| **Ce** | **ppm** | 105 | 117 | 113 | 109 | 112 | 97 | 91 |
| **Pr** | **ppm** | 10.9 | 11.8 | 11.6 | 11.3 | 11.5 | 10.1 | 9.4 |
| **Nd** | **ppm** | 49 | 53 | 53 | 51 | 51 | 43 | 40 |
| **Sm** | **ppm** | 9.7 | 9.3 | 9.6 | 9.1 | 9.4 | 8.4 | 8.1 |
| **Eu** | **ppm** | 1.8 | 1.7 | 1.8 | 1.7 | 1.7 | 0.3 | 0.3 |
| **Gd** | **ppm** | 7.4 | 7.3 | 7.5 | 7.3 | 7.6 | 7.3 | 7.0 |
| **Dy** | **ppm** | 4.3 | 4.1 | 4.4 | 4.3 | 4.1 | 6.1 | 5.5 |
| **Ho** | **ppm** | 0.77 | 0.81 | 0.80 | 0.83 | 0.78 | 1.22 | 1.15 |
| **Er** | **ppm** | 2.11 | 2.07 | 2.15 | 2.06 | 2.19 | 3.52 | 3.32 |
| **Yb** | **ppm** | 1.9 | 1.8 | 2.0 | 1.8 | 1.8 | 3.5 | 3.4 |
| **Lu** | **ppm** | 0.26 | 0.26 | 0.26 | 0.25 | 0.24 | 0.54 | 0.48 |
| **Hf** | **ppm** | 3.8 | 4.7 | 5.3 | 4.0 | 4.1 | 6.2 | 5.1 |
| **Ta** | **ppm** | 0.90 | 1.06 | 1.03 | 0.92 | 0.99 | 1.83 | 1.61 |
| **Tl** | **ppm** | 0.41 | 0.34 | 0.52 | 0.32 | 0.43 | 0.88 | 0.92 |
| **Pb** | **ppm** | 28 | 34 | 32 | 32 | 35 | 37 | 33 |
| **Th** | **ppm** | 21.9 | 27.5 | 25.3 | 23.8 | 25.3 | 42.8 | 38.6 |
| **U** | **ppm** | 5.95 | 7.38 | 6.84 | 6.44 | 6.89 | 11.86 | 11.02 |

Table C1: ICP-AES and ICP-MS results for the explosive and effusive deposits from La Fossa and Vulcanello

ICP-AES and ICP-MS Secondary Standard Data

| | | AGV-2 | | | | | BCR-2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte | unit | AGV-2 | usgs cert | ± | Bias | % Bias | BCR-2 | usgs cert | ± | Bias | % Bias |
| SiO2 | wt% | 59.1 | 59.3 | 0.7 | -0.2 | -0.3 | 54.3 | 54.1 | 0.8 | 0.2 | 0.4 |
| Al2O3 | wt% | 17.1 | 16.9 | 0.2 | 0.1 | 0.9 | 13.7 | 13.5 | 0.2 | 0.2 | 1.5 |
| FeOt | wt% | 6.8 | 6.7 | 0.1 | 0.1 | 2.0 | 14.0 | 13.8 | 0.2 | 0.2 | 1.3 |
| MgO | wt% | 1.76 | 1.79 | 0.03 | -0.03 | -1.59 | 3.64 | 3.59 | 0.05 | 0.05 | 1.52 |
| CaO | wt% | 5.23 | 5.20 | 0.13 | 0.03 | 0.52 | 7.20 | 7.12 | 0.11 | 0.08 | 1.17 |
| Na2O | wt% | 4.36 | 4.19 | 0.13 | 0.17 | 4.13 | 3.27 | 3.16 | 0.11 | 0.11 | 3.50 |
| K2O | wt% | 3.10 | 2.88 | 0.11 | 0.22 | 7.53 | 1.92 | 1.79 | 0.05 | 0.13 | 7.41 |
| TiO2 | wt% | 1.08 | 1.05 | 0.22 | 0.03 | 2.66 | 2.34 | 2.26 | 0.05 | 0.08 | 3.70 |
| P2O5 | wt% | 0.46 | 0.48 | 0.02 | -0.02 | -5.13 | 0.33 | 0.35 | 0.02 | -0.02 | -5.85 |
| MnO | wt% | 0.1 | | | | | 0.2 | | | | |
| Total | wt% | 99.1 | 98.5 | | | | 100.9 | 99.7 | | | |
| Alkali | (K+Na) | 7.5 | | | | | 5.2 | | | | |
| Ba | ppm | 1172 | 1140 | 32 | 32 | 3 | 697 | 683 | 28 | 14 | 2 |
| Sr | ppm | 683 | 658 | 17 | 25 | 4 | 353 | 346 | 14 | 7 | 2 |
| Y | ppm | 22 | 20 | 1 | 2 | 12 | 40 | 37 | 2 | 3 | 8 |
| Zr | ppm | 226 | 230 | 4 | -4 | -2 | 186 | 188 | 16 | -2 | -1 |
| Co | ppm | 14 | 16 | 1 | -2 | -12 | 42 | 37 | 3 | 5 | 13 |
| Cr | ppm | 12 | 17 | 2 | -5 | -28 | 11 | 18 | 2 | -7 | -41 |
| Cu | ppm | 49 | 53 | 4 | -4 | -7 | 15 | 19 | 2 | -4 | -20 |
| Ni | ppm | 13 | 19 | 3 | -6 | -29 | 12 | | | | |
| Sc | ppm | 10 | 13 | 1 | -3 | -21 | 33 | 33 | 2 | 0 | 1 |
| V | ppm | 123 | 120 | 5 | 3 | 2 | 413 | 416 | 14 | -3 | -1 |
| Rb | ppm | 64 | 69 | 2 | -4 | -6 | 46 | 48 | 2 | -2 | -4 |
| Nb | ppm | 12 | 15 | 1 | -3 | -21 | 11 | | | | |
| Cs | ppm | 1.3 | 1.2 | 0.1 | 0.1 | 8.7 | 1.3 | 1.1 | 0.1 | 0.2 | 15.5 |
| La | ppm | 42 | 38 | 1 | 4 | 11 | 30 | 25 | 1 | 5 | 19 |
| Ce | ppm | 71 | 68 | 3 | 3 | 5 | 54 | 53 | 2 | 1 | 2 |
| Pr | ppm | 7.8 | 8.3 | 0.6 | -0.5 | -5.7 | 6.5 | 6.8 | 0.3 | -0.3 | -4.5 |
| Nd | ppm | 35 | 30 | 2 | 5 | 18 | 35 | 28 | 2 | 7 | 24 |
| Sm | ppm | 6.6 | 5.7 | 0.3 | 0.9 | 15.0 | 7.1 | 6.7 | 0.3 | 0.4 | 6.5 |
| Eu | ppm | 1.5 | 1.5 | 0.1 | 0.0 | -2.0 | 1.9 | 2.0 | 0.1 | -0.1 | -7.4 |
| Gd | ppm | 5.0 | 20.0 | 1.0 | -15.0 | -74.9 | 7.6 | 6.8 | 0.3 | 0.8 | 11.1 |
| Dy | ppm | 3.5 | 3.6 | 0.2 | -0.1 | -3.1 | 6.3 | | | | |
| Ho | ppm | 0.66 | 0.71 | 0.08 | -0.05 | -6.70 | 1.32 | 1.33 | 0.06 | -0.01 | -0.46 |
| Er | ppm | 1.86 | 1.79 | 0.11 | 0.07 | 3.65 | 3.60 | | | | |
| Yb | ppm | 1.5 | 1.6 | 0.2 | -0.1 | -5.1 | 2.8 | 3.5 | 0.2 | -0.7 | -19.3 |
| Lu | ppm | 0.22 | 0.25 | 0.01 | -0.03 | -13.11 | 0.43 | 0.51 | 0.02 | -0.08 | -15.70 |
| Hf | ppm | 5.3 | 5.1 | 0.2 | 0.2 | 3.6 | 4.7 | 4.8 | 0.2 | -0.1 | -1.3 |
| Ta | ppm | 0.70 | 0.89 | 0.08 | -0.19 | -21.51 | 0.66 | | | | |
| Tl | ppm | 0.58 | 0.27 | | 0.31 | 113.41 | 0.49 | | | | |
| Pb | ppm | 24 | 13 | 1 | 11 | 88 | 18 | 11 | 2 | 7 | 63 |
| Th | ppm | 6.1 | 6.1 | 0.6 | 0.0 | 0.3 | 6.1 | 6.2 | 0.7 | -0.1 | -2.0 |
| U | ppm | 1.78 | 1.88 | 0.16 | -0.10 | -5.53 | 1.68 | 1.69 | 0.19 | -0.01 | -0.62 |

Table C2: ICP-AES and ICP-MS standards for AGV-2 and BCR-2

A comparison of the AGV-2 and BCR-2 standards analysed with the USGS recommended values gives an indication of the accuracy of the data. There are significant differences (shown by the %Bias) in Tl and Pb due to the ICP-MS methodology used.

## APPENDIX D – EMPA Preparation, Data and Standards

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Sample Preparation

- Samples cleaned manually, then in an ultrasonic bath, before being dried over night at 50°C.
- Samples then crushed lightly with a hammer before being split into two.
- 15 – 20 shards were mounted on a glass slide.
- The glass slide was mounted in epoxy resin to make a stub, and then polished.
- The stubs were cleaned with ethanol, then carbon coated.
- Carbon coating was done at Department of Archaeology, University of Oxford.
- Stubs were then loaded into the EMPA-WDS (Jeol 8600 equipped with 4 spectrometers and SamX software) in the Department of Archaeology, University of Oxford.
- The EMPA was set up and calibrated by Dr. Victoria Smith with secondary standards used to check the precision and accuracy of the run.
    - Accelerating voltage : 15kV
    - Beam current: 6nA (for glass analysis)
    - defocused (10µm) beam to minimise Na migration
    - Count times: 30s on each peak, except for Na (10s) and Cl & P (60s)
    - Calibrated for each set of beam conditions using a suite of appropriate mineral standards
    - Secondary Standards used: MPI-DING fused volcanic glass standards (ATHO, GOR-128, GOR-132 and STHS6/80)
    - Absorption correction method: PAP
- Points for analysis were programmed into the microprobe, using the attached SEM to help with choosing optimal locations.
- Once all points were programmed, the microprobe was set running over night.

EMPA Data

The EMPA glass data produced during this research is shown in the tables on the next 25 pages. The tables are divided by the location of where the samples were collected: on La Fossa, Vulcanello or Lipari. The tables also include the date the analysis was run (which means that they can be linked to the exact secondary standards for each run) and the name of the eruptive unit the sample came from. The start of the sample label is the sample name (and this will match up with the name given in table B1-B4). The second part of the sample label is the clast number within the analytical stub and the final part is the analysis number for that individual clast.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 |
| **Label** | AT13.1.1 | AT13.1.2 | AT13.1.3 | AT13.10.1 | AT13.11.1 | AT13.11.2 | AT13.11.3 | AT13.12.1 | AT13.13.1 | AT13.13.2 |
| **Na2O** | 4.54 | 4.38 | 4.62 | 4.25 | 4.58 | 4.93 | 4.24 | 4.77 | 4.76 | 4.45 |
| **MgO** | 0.60 | 0.53 | 0.35 | 0.54 | 0.52 | 0.19 | 0.59 | 0.54 | 0.77 | 0.63 |
| **Al2O3** | 15.28 | 15.13 | 16.96 | 15.56 | 15.45 | 19.87 | 15.32 | 16.95 | 15.92 | 15.86 |
| **SiO2** | 64.99 | 65.61 | 64.94 | 64.00 | 65.28 | 62.67 | 65.15 | 65.02 | 64.28 | 60.59 |
| **P2O5** | 0.15 | 0.10 | 0.09 | 0.06 | 0.16 | 0.04 | 0.28 | 0.18 | 0.19 | 0.17 |
| **ClO2** | 0.37 | 0.36 | 0.20 | 0.29 | 0.38 | 0.14 | 0.35 | 0.31 | 0.32 | 0.38 |
| **K2O** | 6.46 | 6.56 | 7.06 | 6.03 | 6.72 | 6.53 | 6.58 | 6.35 | 6.26 | 6.55 |
| **CaO** | 1.56 | 1.61 | 1.57 | 1.51 | 1.52 | 2.32 | 1.75 | 2.03 | 1.93 | 1.75 |
| **TiO2** | 0.39 | 0.35 | 0.25 | 0.65 | 0.31 | 0.16 | 0.42 | 0.34 | 0.40 | 0.34 |
| **MnO** | 0.11 | 0.03 | 0.03 | 0.08 | 0.11 | 0.05 | 0.04 | 0.00 | 0.10 | 0.14 |
| **FeOt** | 4.13 | 3.93 | 2.19 | 7.10 | 3.76 | 1.61 | 3.83 | 3.42 | 3.99 | 4.18 |
| **Total** | 98.59 | 98.59 | 98.26 | 100.08 | 98.79 | 98.51 | 98.54 | 99.90 | 98.92 | 95.02 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 |
| **Label** | AT13.14.1 | AT13.14.2 | AT13.14.3 | AT13.15.1 | AT13.15.2 | AT13.15.3 | AT13.2.1 | AT13.2.2 | AT13.2.3 | AT13.4.1 |
| **Na2O** | 4.51 | 4.37 | 4.73 | 4.93 | 4.44 | 4.50 | 4.22 | 4.46 | 4.85 | 4.66 |
| **MgO** | 0.58 | 0.53 | 0.65 | 0.54 | 0.54 | 0.57 | 0.42 | 0.52 | 0.37 | 0.57 |
| **Al2O3** | 15.59 | 15.71 | 16.28 | 16.26 | 15.96 | 15.41 | 14.64 | 15.29 | 15.04 | 15.51 |
| **SiO2** | 65.74 | 64.99 | 63.09 | 64.80 | 63.40 | 64.70 | 67.82 | 66.12 | 65.49 | 65.58 |
| **P2O5** | 0.22 | 0.20 | 1.07 | 0.19 | 0.75 | 0.88 | 0.08 | 0.22 | 0.09 | 0.15 |
| **ClO2** | 0.32 | 0.39 | 0.30 | 0.33 | 0.35 | 0.33 | 0.40 | 0.42 | 0.26 | 0.33 |
| **K2O** | 6.50 | 6.74 | 6.34 | 6.11 | 6.51 | 6.37 | 6.45 | 6.51 | 6.43 | 6.34 |
| **CaO** | 1.63 | 1.51 | 3.05 | 1.83 | 2.37 | 2.33 | 1.26 | 1.62 | 1.47 | 1.63 |
| **TiO2** | 0.33 | 0.41 | 0.37 | 0.33 | 0.30 | 0.34 | 0.29 | 0.31 | 0.26 | 0.39 |
| **MnO** | 0.17 | 0.14 | 0.17 | 0.08 | 0.15 | 0.14 | 0.11 | 0.03 | 0.00 | 0.05 |
| **FeOt** | 3.83 | 3.76 | 3.99 | 3.98 | 3.71 | 3.98 | 2.98 | 3.60 | 2.76 | 4.17 |
| **Total** | 99.41 | 98.74 | 100.03 | 99.39 | 98.48 | 99.54 | 98.67 | 99.10 | 97.02 | 99.39 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | Pietre Cotte |
| **Label** | AT13.4.2 | AT13.5.1 | AT13.5.2 | AT13.7.1 | AT13.7.2 | AT13.7.3 | AT13.9.1 | AT13.9.2 | AT13.9.3 | S90b2.1.1 |
| **Na2O** | 4.90 | 4.66 | 4.36 | 5.63 | 4.57 | 4.48 | 4.10 | 4.71 | 5.07 | 4.94 |
| **MgO** | 0.38 | 0.48 | 0.51 | 0.02 | 0.50 | 0.44 | 0.10 | 0.65 | 0.16 | 1.26 |
| **Al2O3** | 17.85 | 15.81 | 15.57 | 21.62 | 15.56 | 15.05 | 17.05 | 15.88 | 20.37 | 17.08 |
| **SiO2** | 65.18 | 66.14 | 66.38 | 61.68 | 66.73 | 67.47 | 67.34 | 63.90 | 61.56 | 58.86 |
| **P2O5** | 0.13 | 0.12 | 0.14 | 0.17 | 0.15 | 0.09 | 0.00 | 0.45 | 0.13 | 0.47 |
| **ClO2** | 0.29 | 0.33 | 0.32 | 0.02 | 0.35 | 0.39 | 0.14 | 0.42 | 0.12 | 0.29 |
| **K2O** | 5.86 | 6.73 | 6.44 | 5.38 | 6.66 | 6.55 | 8.74 | 6.33 | 6.11 | 7.03 |
| **CaO** | 2.46 | 1.61 | 1.41 | 3.45 | 1.52 | 1.25 | 0.59 | 1.91 | 2.72 | 3.05 |
| **TiO2** | 0.30 | 0.35 | 0.32 | 0.11 | 0.25 | 0.27 | 0.10 | 0.34 | 0.13 | 0.54 |
| **MnO** | 0.01 | 0.09 | 0.12 | 0.00 | 0.10 | 0.19 | 0.01 | 0.13 | 0.06 | 0.09 |
| **FeOt** | 2.97 | 3.52 | 3.89 | 0.53 | 3.67 | 3.37 | 1.17 | 4.46 | 1.45 | 5.83 |
| **Total** | 100.34 | 99.83 | 99.47 | 98.61 | 100.05 | 99.53 | 99.34 | 99.18 | 97.86 | 99.45 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | S90b2.1.2 | S90b2.1.3 | S90b2.1.4 | S90b2.1.5 | S90b2.2.1 | S90b2.2.2 | S90b2.2.3 | S90b2.2.4 | S90b2.2.5 | S90b2.3.1 |
| **Na2O** | 4.71 | 4.99 | 4.58 | 4.55 | 4.68 | 4.64 | 4.72 | 4.59 | 4.55 | 4.96 |
| **MgO** | 1.17 | 1.22 | 1.20 | 1.30 | 1.20 | 1.36 | 1.24 | 1.23 | 1.25 | 1.25 |
| **Al2O3** | 17.38 | 17.31 | 17.29 | 17.14 | 17.07 | 16.95 | 17.31 | 17.37 | 17.49 | 17.37 |
| **SiO2** | 59.15 | 59.08 | 58.92 | 58.84 | 59.14 | 58.85 | 59.06 | 58.92 | 58.74 | 59.33 |
| **P2O5** | 0.45 | 0.38 | 0.40 | 0.42 | 0.43 | 0.40 | 0.44 | 0.43 | 0.44 | 0.40 |
| **ClO2** | 0.31 | 0.29 | 0.31 | 0.37 | 0.34 | 0.29 | 0.34 | 0.33 | 0.34 | 0.33 |
| **K2O** | 7.12 | 7.21 | 7.09 | 7.12 | 7.20 | 7.07 | 7.05 | 6.89 | 7.09 | 6.97 |
| **CaO** | 3.02 | 3.05 | 2.99 | 3.19 | 2.77 | 2.78 | 2.83 | 3.19 | 2.97 | 3.06 |
| **TiO2** | 0.55 | 0.54 | 0.58 | 0.55 | 0.64 | 0.51 | 0.54 | 0.58 | 0.51 | 0.53 |
| **MnO** | 0.06 | 0.15 | 0.13 | 0.15 | 0.00 | 0.05 | 0.24 | 0.21 | 0.18 | 0.16 |
| **FeOt** | 5.47 | 5.54 | 5.61 | 5.69 | 5.38 | 5.54 | 5.09 | 5.62 | 5.69 | 5.38 |
| **Total** | 99.39 | 99.76 | 99.11 | 99.33 | 98.85 | 98.43 | 98.85 | 99.35 | 99.24 | 99.73 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | S90b2.3.2 | S90b2.3.3 | S90b2.3.4 | S90b2.4.1 | S90b2.4.2 | S90b2.4.3 | S90b2.4.4 | S90b2.5.1 | S90b2.5.3 | S90b2.5.4 |
| **Na2O** | 4.49 | 4.71 | 4.56 | 4.84 | 4.58 | 4.73 | 4.56 | 4.51 | 4.52 | 4.60 |
| **MgO** | 1.21 | 1.27 | 1.23 | 1.17 | 1.23 | 0.98 | 1.26 | 1.20 | 1.28 | 1.20 |
| **Al2O3** | 17.14 | 17.59 | 17.42 | 17.57 | 17.12 | 18.80 | 17.37 | 17.55 | 17.06 | 17.01 |
| **SiO2** | 57.99 | 58.55 | 58.59 | 59.12 | 58.39 | 57.77 | 58.61 | 58.44 | 58.59 | 58.97 |
| **P2O5** | 0.37 | 0.37 | 0.41 | 0.38 | 0.44 | 0.35 | 0.43 | 0.36 | 0.32 | 0.39 |
| **ClO2** | 0.31 | 0.34 | 0.36 | 0.37 | 0.35 | 0.28 | 0.34 | 0.32 | 0.26 | 0.30 |
| **K2O** | 7.04 | 7.20 | 7.17 | 7.02 | 7.07 | 6.01 | 7.19 | 7.07 | 7.10 | 6.92 |
| **CaO** | 2.76 | 2.74 | 3.15 | 2.81 | 2.84 | 4.27 | 3.05 | 2.78 | 3.13 | 2.85 |
| **TiO2** | 0.58 | 0.59 | 0.56 | 0.61 | 0.55 | 0.49 | 0.59 | 0.50 | 0.55 | 0.60 |
| **MnO** | 0.15 | 0.22 | 0.10 | 0.08 | 0.22 | 0.20 | 0.19 | 0.10 | 0.11 | 0.14 |
| **FeOt** | 5.31 | 5.68 | 5.69 | 5.90 | 5.46 | 4.47 | 5.61 | 5.32 | 5.62 | 5.54 |
| **Total** | 97.35 | 99.26 | 99.24 | 99.87 | 98.24 | 98.35 | 99.19 | 98.15 | 98.54 | 98.51 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | S90b2.5.5 | S90b2.6.1 | S90b2.6.2 | S90b2.6.3 | S90b2.6.4 | S90b2.6.5 | S90b2.7.1 | S90b2.7.2 | S90b2.7.4 | S90b2.7.5 |
| **Na2O** | 4.76 | 4.73 | 4.41 | 4.58 | 4.80 | 4.46 | 4.49 | 4.71 | 4.49 | 4.61 |
| **MgO** | 1.14 | 1.15 | 1.23 | 1.20 | 1.16 | 1.21 | 1.26 | 1.25 | 1.18 | 1.22 |
| **Al2O3** | 16.80 | 17.11 | 17.06 | 17.13 | 17.09 | 17.42 | 17.49 | 17.05 | 17.29 | 17.14 |
| **SiO2** | 58.45 | 58.88 | 58.89 | 59.01 | 59.25 | 59.62 | 58.63 | 59.01 | 58.63 | 58.74 |
| **P2O5** | 0.38 | 0.40 | 0.46 | 0.43 | 0.40 | 0.39 | 0.34 | 0.43 | 0.43 | 0.36 |
| **ClO2** | 0.36 | 0.31 | 0.29 | 0.32 | 0.31 | 0.31 | 0.33 | 0.32 | 0.34 | 0.36 |
| **K2O** | 6.87 | 7.02 | 7.09 | 7.05 | 7.07 | 7.08 | 7.12 | 7.15 | 6.94 | 7.10 |
| **CaO** | 3.08 | 3.07 | 2.91 | 2.82 | 2.83 | 2.82 | 3.02 | 2.76 | 3.06 | 2.78 |
| **TiO2** | 0.56 | 0.60 | 0.56 | 0.50 | 0.53 | 0.61 | 0.54 | 0.52 | 0.59 | 0.56 |
| **MnO** | 0.22 | 0.18 | 0.10 | 0.13 | 0.07 | 0.15 | 0.05 | 0.12 | 0.16 | 0.09 |
| **FeOt** | 5.83 | 5.89 | 5.31 | 5.33 | 5.56 | 5.58 | 5.65 | 5.51 | 5.79 | 5.30 |
| **Total** | 98.46 | 99.33 | 98.30 | 98.49 | 99.08 | 99.66 | 98.92 | 98.84 | 98.90 | 98.25 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | S90ca.1.1 | S90ca.1.2 | S90ca.1.3 | S90ca.1.4 | S90ca.1.5 | S90ca.2.1 | S90ca.2.2 | S90ca.2.3 | S90ca.2.4 | S90ca.2.5 |
| **Na2O** | 4.70 | 4.69 | 4.53 | 4.76 | 4.64 | 4.48 | 4.91 | 4.72 | 4.68 | 4.54 |
| **MgO** | 1.24 | 1.19 | 1.28 | 1.28 | 1.24 | 1.27 | 1.17 | 1.27 | 1.26 | 1.33 |
| **Al2O3** | 17.12 | 17.49 | 17.28 | 17.38 | 17.22 | 17.77 | 17.66 | 17.16 | 16.91 | 17.19 |
| **SiO2** | 58.70 | 59.27 | 58.79 | 58.75 | 58.94 | 58.45 | 59.00 | 58.66 | 58.87 | 58.80 |
| **P2O5** | 0.40 | 0.40 | 0.37 | 0.42 | 0.33 | 0.44 | 0.45 | 0.41 | 0.38 | 0.36 |
| **ClO2** | 0.30 | 0.30 | 0.31 | 0.28 | 0.29 | 0.29 | 0.35 | 0.31 | 0.35 | 0.35 |
| **K2O** | 7.32 | 7.13 | 7.14 | 7.02 | 7.06 | 7.19 | 7.19 | 7.12 | 7.08 | 7.13 |
| **CaO** | 3.18 | 2.74 | 3.01 | 2.95 | 3.00 | 2.88 | 2.69 | 3.10 | 3.00 | 2.90 |
| **TiO2** | 0.59 | 0.58 | 0.61 | 0.64 | 0.55 | 0.57 | 0.55 | 0.59 | 0.53 | 0.59 |
| **MnO** | 0.24 | 0.16 | 0.18 | 0.03 | 0.10 | 0.05 | 0.19 | 0.09 | 0.11 | 0.14 |
| **FeOt** | 5.71 | 5.50 | 5.70 | 5.28 | 5.26 | 5.68 | 5.46 | 5.43 | 5.53 | 5.63 |
| **Total** | 99.50 | 99.44 | 99.21 | 98.78 | 98.62 | 99.09 | 99.62 | 98.87 | 98.70 | 98.97 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | S90ca.3.1 | S90ca.3.2 | S90ca.3.3 | S90ca.3.4 | S90ca.3.5 | S90ca.4.1 | S90ca.4.2 | S90ca.4.3 | S90ca.4.4 | S90ca.4.5 |
| **Na2O** | 4.19 | 4.46 | 4.23 | 4.73 | 4.57 | 4.70 | 4.53 | 4.79 | 4.62 | 4.76 |
| **MgO** | 1.20 | 1.21 | 1.16 | 1.29 | 1.19 | 1.21 | 1.18 | 1.23 | 1.22 | 1.24 |
| **Al2O3** | 16.85 | 16.76 | 17.17 | 17.59 | 17.61 | 17.26 | 17.37 | 16.25 | 17.37 | 17.39 |
| **SiO2** | 58.30 | 58.82 | 58.10 | 59.03 | 58.71 | 58.96 | 59.06 | 57.21 | 58.41 | 58.50 |
| **P2O5** | 0.38 | 0.39 | 0.39 | 0.40 | 0.40 | 0.36 | 0.44 | 0.44 | 0.42 | 0.42 |
| **ClO2** | 0.37 | 0.34 | 0.34 | 0.32 | 0.32 | 0.32 | 0.30 | 0.34 | 0.34 | 0.35 |
| **K2O** | 7.49 | 7.30 | 7.64 | 6.93 | 6.86 | 7.05 | 7.04 | 6.99 | 7.12 | 7.12 |
| **CaO** | 2.68 | 2.83 | 2.75 | 2.80 | 3.19 | 2.71 | 2.91 | 3.05 | 3.03 | 2.96 |
| **TiO2** | 0.57 | 0.54 | 0.58 | 0.56 | 0.59 | 0.66 | 0.53 | 0.60 | 0.55 | 0.58 |
| **MnO** | 0.07 | 0.10 | 0.17 | 0.22 | 0.23 | 0.20 | 0.16 | 0.17 | 0.16 | 0.26 |
| **FeOt** | 5.71 | 5.63 | 5.46 | 5.66 | 5.80 | 5.10 | 5.59 | 5.25 | 5.47 | 5.62 |
| **Total** | 97.81 | 98.38 | 97.97 | 99.54 | 99.45 | 98.53 | 99.12 | 96.32 | 98.72 | 99.18 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | S90ca.4.6 | S90ca.5.1 | S90ca.5.2 | S90ca.5.3 | S90ca.5.4 | S90ca.5.5 | S90ca.6.1 | S90ca.6.2 | S90ca.6.3 | S90ca.6.4 |
| Na2O | 4.73 | 4.54 | 4.45 | 4.52 | 4.93 | 4.65 | 4.50 | 4.48 | 4.49 | 4.55 |
| MgO | 1.23 | 1.25 | 1.17 | 1.25 | 1.15 | 1.21 | 1.22 | 1.20 | 1.25 | 1.22 |
| Al2O3 | 17.26 | 17.60 | 17.15 | 17.17 | 17.30 | 17.20 | 16.73 | 17.14 | 17.06 | 17.06 |
| SiO2 | 58.34 | 59.09 | 58.66 | 58.75 | 58.31 | 58.39 | 57.77 | 58.54 | 58.92 | 57.49 |
| P2O5 | 0.38 | 0.38 | 0.39 | 0.43 | 0.41 | 0.44 | 0.37 | 0.45 | 0.38 | 0.40 |
| ClO2 | 0.33 | 0.33 | 0.32 | 0.34 | 0.38 | 0.32 | 0.35 | 0.36 | 0.35 | 0.36 |
| K2O | 6.95 | 7.17 | 6.85 | 6.92 | 7.05 | 6.97 | 6.87 | 7.03 | 7.25 | 6.96 |
| CaO | 3.11 | 2.82 | 3.05 | 2.87 | 2.86 | 2.95 | 2.99 | 2.92 | 2.89 | 3.03 |
| TiO2 | 0.55 | 0.63 | 0.55 | 0.57 | 0.53 | 0.59 | 0.59 | 0.56 | 0.56 | 0.55 |
| MnO | 0.11 | 0.10 | 0.07 | 0.20 | 0.11 | 0.18 | 0.12 | 0.14 | 0.12 | 0.12 |
| FeOt | 5.39 | 5.31 | 5.53 | 5.73 | 5.61 | 5.59 | 5.44 | 5.36 | 5.52 | 5.35 |
| Total | 98.35 | 99.22 | 98.20 | 98.73 | 98.64 | 98.48 | 96.95 | 98.19 | 98.78 | 97.09 |
| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | S90ca.6.5 | S90ca.7.1 | S90ca.7.2 | S90ca.7.3 | S90ca.7.4 | S90ca.7.5 | S90ca.7.6 | S90ca.8.2 | S90ca.8.3 | S90ca.8.4 |
| Na2O | 4.60 | 4.70 | 4.63 | 4.64 | 4.52 | 4.77 | 4.66 | 4.71 | 4.65 | 4.66 |
| MgO | 1.22 | 1.21 | 1.23 | 1.27 | 1.20 | 1.21 | 1.29 | 1.21 | 1.24 | 1.20 |
| Al2O3 | 17.58 | 17.46 | 17.46 | 17.04 | 17.06 | 17.27 | 17.13 | 17.08 | 17.56 | 17.38 |
| SiO2 | 58.80 | 58.68 | 58.81 | 58.41 | 57.88 | 58.50 | 58.89 | 58.34 | 59.01 | 58.72 |
| P2O5 | 0.44 | 0.38 | 0.39 | 0.45 | 0.38 | 0.35 | 0.39 | 0.47 | 0.46 | 0.39 |
| ClO2 | 0.37 | 0.34 | 0.31 | 0.34 | 0.37 | 0.32 | 0.35 | 0.29 | 0.36 | 0.35 |
| K2O | 7.12 | 7.07 | 7.08 | 7.12 | 6.87 | 7.00 | 6.91 | 7.00 | 7.25 | 7.29 |
| CaO | 2.94 | 3.04 | 3.00 | 3.08 | 3.02 | 2.97 | 3.02 | 2.89 | 2.97 | 3.08 |
| TiO2 | 0.57 | 0.55 | 0.57 | 0.56 | 0.50 | 0.56 | 0.63 | 0.57 | 0.60 | 0.62 |
| MnO | 0.16 | 0.04 | 0.16 | 0.29 | 0.08 | 0.16 | 0.10 | 0.13 | 0.13 | 0.14 |
| FeOt | 5.29 | 5.50 | 5.53 | 5.38 | 5.34 | 5.26 | 5.40 | 5.10 | 5.66 | 5.61 |
| Total | 99.09 | 98.96 | 99.16 | 98.58 | 97.22 | 98.36 | 98.78 | 97.79 | 99.88 | 99.46 |
| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | S90ca.8.5 | S90cb.1.1 | S90cb.1.2 | S90cb.1.3 | S90cb.1.4 | S90cb.1.5 | S90cb.2.1 | S90cb.2.2 | S90cb.2.3 | S90cb.2.4 |
| Na2O | 4.73 | 4.32 | 4.17 | 4.29 | 4.06 | 4.39 | 4.60 | 4.57 | 4.80 | 4.52 |
| MgO | 1.22 | 1.10 | 1.24 | 1.26 | 1.24 | 1.19 | 1.26 | 1.21 | 1.23 | 1.25 |
| Al2O3 | 17.94 | 17.25 | 17.57 | 17.30 | 17.77 | 16.66 | 17.48 | 17.50 | 17.24 | 17.37 |
| SiO2 | 59.40 | 57.87 | 57.89 | 57.21 | 57.92 | 57.20 | 59.40 | 59.20 | 58.88 | 58.89 |
| P2O5 | 0.38 | 0.40 | 0.42 | 0.41 | 0.41 | 0.42 | 0.37 | 0.41 | 0.39 | 0.46 |
| ClO2 | 0.34 | 0.31 | 0.27 | 0.32 | 0.31 | 0.31 | 0.32 | 0.35 | 0.32 | 0.33 |
| K2O | 7.17 | 7.02 | 6.72 | 6.86 | 6.49 | 6.72 | 7.28 | 7.19 | 7.06 | 7.31 |
| CaO | 2.76 | 2.55 | 2.65 | 2.86 | 2.84 | 2.59 | 3.16 | 3.20 | 3.20 | 3.09 |
| TiO2 | 0.58 | 0.61 | 0.53 | 0.60 | 0.59 | 0.49 | 0.52 | 0.53 | 0.66 | 0.56 |
| MnO | 0.09 | 0.15 | 0.21 | 0.11 | 0.20 | 0.15 | 0.07 | 0.13 | 0.17 | 0.09 |
| FeOt | 5.80 | 5.42 | 5.64 | 5.52 | 5.36 | 5.26 | 5.56 | 5.05 | 5.70 | 5.66 |
| Total | 100.43 | 96.99 | 97.31 | 96.74 | 97.18 | 95.39 | 100.01 | 99.34 | 99.66 | 99.52 |
| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | S90cb.2.5 | S90cb.3.1 | S90cb.3.2 | S90cb.3.3 | S90cb.3.4 | S90cb.3.5 | S90cb.4.1 | S90cb.4.2 | S90cb.4.3 | S90cb.4.4 |
| Na2O | 4.85 | 4.34 | 4.69 | 4.60 | 4.57 | 4.77 | 4.66 | 4.65 | 4.52 | 4.33 |
| MgO | 1.26 | 1.28 | 1.23 | 1.30 | 1.28 | 1.24 | 1.21 | 1.20 | 1.21 | 1.19 |
| Al2O3 | 17.33 | 17.19 | 17.13 | 17.51 | 17.60 | 17.31 | 17.20 | 17.04 | 17.53 | 16.84 |
| SiO2 | 58.93 | 58.87 | 58.41 | 59.12 | 59.16 | 58.92 | 58.23 | 58.84 | 58.47 | 58.88 |
| P2O5 | 0.41 | 0.41 | 0.46 | 0.39 | 0.45 | 0.37 | 0.35 | 0.41 | 0.43 | 0.38 |
| ClO2 | 0.35 | 0.34 | 0.34 | 0.31 | 0.27 | 0.31 | 0.35 | 0.27 | 0.34 | 0.37 |
| K2O | 7.10 | 7.19 | 6.93 | 7.13 | 7.15 | 6.96 | 6.81 | 7.08 | 7.11 | 7.15 |
| CaO | 3.06 | 3.08 | 3.10 | 2.90 | 3.03 | 3.04 | 2.92 | 2.92 | 2.91 | 3.01 |
| TiO2 | 0.56 | 0.57 | 0.52 | 0.69 | 0.57 | 0.58 | 0.60 | 0.54 | 0.62 | 0.56 |
| MnO | 0.16 | 0.15 | 0.13 | 0.14 | 0.11 | 0.14 | 0.16 | 0.15 | 0.01 | 0.05 |
| FeOt | 5.58 | 5.41 | 5.46 | 5.37 | 5.83 | 5.38 | 5.70 | 5.37 | 5.28 | 5.70 |
| Total | 99.59 | 98.83 | 98.41 | 99.46 | 100.03 | 99.01 | 98.20 | 98.46 | 98.43 | 98.46 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | S90cb.4.5 | S90cb.5.1 | S90cb.5.2 | S90cb.5.3 | S90cb.5.4 | S90cb.5.5 | S90cb.6.1 | S90cb.6.2 | S90cb.6.3 | S90cb.6.4 |
| Na2O | 4.62 | 4.75 | 4.75 | 5.11 | 5.00 | 4.74 | 4.44 | 4.66 | 4.39 | 4.87 |
| MgO | 1.26 | 1.24 | 1.30 | 1.25 | 1.26 | 1.20 | 1.26 | 1.28 | 1.20 | 1.24 |
| Al2O3 | 17.13 | 17.21 | 17.14 | 17.20 | 17.11 | 17.05 | 17.14 | 17.14 | 17.32 | 17.35 |
| SiO2 | 58.64 | 57.73 | 58.36 | 59.15 | 58.58 | 58.99 | 58.23 | 58.50 | 58.92 | 58.45 |
| P2O5 | 0.43 | 0.42 | 0.35 | 0.40 | 0.37 | 0.40 | 0.44 | 0.39 | 0.37 | 0.42 |
| ClO2 | 0.31 | 0.40 | 0.36 | 0.35 | 0.34 | 0.30 | 0.33 | 0.31 | 0.36 | 0.32 |
| K2O | 7.20 | 7.05 | 7.00 | 7.09 | 6.97 | 6.99 | 7.01 | 7.04 | 7.09 | 7.13 |
| CaO | 3.04 | 2.94 | 2.91 | 3.03 | 2.96 | 2.76 | 3.09 | 2.68 | 2.95 | 2.81 |
| TiO2 | 0.54 | 0.52 | 0.58 | 0.57 | 0.55 | 0.58 | 0.56 | 0.57 | 0.59 | 0.62 |
| MnO | 0.10 | 0.05 | 0.11 | 0.00 | 0.05 | 0.13 | 0.08 | 0.18 | 0.15 | 0.13 |
| FeOt | 5.34 | 5.39 | 5.72 | 5.59 | 5.48 | 5.76 | 5.52 | 5.48 | 5.83 | 5.90 |
| Total | 98.61 | 97.70 | 98.59 | 99.74 | 98.68 | 98.92 | 98.11 | 98.21 | 99.17 | 99.23 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | S90cb.6.5 | S90cb.7.1 | S90cb.7.2 | S90cb.7.3 | S90cb.7.4 | S90cb.7.5 | S90cb.8.1 | S90cb.8.2 | S90cb.8.3 | S90cb.8.4 |
| Na2O | 4.76 | 4.80 | 4.84 | 4.51 | 4.71 | 4.69 | 4.56 | 4.64 | 4.49 | 4.69 |
| MgO | 1.31 | 1.22 | 1.28 | 1.25 | 1.20 | 1.22 | 1.27 | 1.27 | 1.23 | 1.26 |
| Al2O3 | 16.74 | 16.21 | 16.26 | 17.21 | 17.29 | 16.98 | 16.97 | 16.74 | 17.02 | 17.52 |
| SiO2 | 57.99 | 57.18 | 57.16 | 58.49 | 58.46 | 58.49 | 58.22 | 58.41 | 58.36 | 58.69 |
| P2O5 | 0.37 | 0.35 | 0.45 | 0.43 | 0.41 | 0.43 | 0.40 | 0.41 | 0.41 | 0.38 |
| ClO2 | 0.36 | 0.36 | 0.33 | 0.37 | 0.32 | 0.33 | 0.35 | 0.34 | 0.37 | 0.34 |
| K2O | 7.03 | 7.05 | 6.90 | 7.09 | 7.05 | 6.99 | 6.99 | 6.96 | 7.15 | 7.17 |
| CaO | 3.02 | 2.99 | 2.94 | 3.01 | 2.84 | 2.82 | 2.99 | 2.81 | 2.95 | 2.84 |
| TiO2 | 0.64 | 0.59 | 0.58 | 0.57 | 0.56 | 0.56 | 0.62 | 0.59 | 0.56 | 0.57 |
| MnO | 0.20 | 0.10 | 0.14 | 0.16 | 0.03 | 0.06 | 0.11 | 0.27 | 0.09 | 0.16 |
| FeOt | 5.35 | 5.36 | 5.84 | 5.58 | 5.64 | 5.57 | 5.71 | 5.50 | 5.63 | 5.92 |
| Total | 97.77 | 96.23 | 96.71 | 98.67 | 98.52 | 98.15 | 98.18 | 97.95 | 98.25 | 99.53 |

| Date Analysed | 10.06.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | S90cb.8.5 | AT1.b1.3 | AT1.b2.1 | AT1.b2.3 | AT1.b3.1 | AT1.b3.2 | AT1.b3.3 | AT1.b6.3 | AT1.w1.1 | AT1.w1.2 |
| Na2O | 4.60 | 4.84 | 4.99 | 4.02 | 4.68 | 5.16 | 4.89 | 4.50 | 4.86 | 4.10 |
| MgO | 1.18 | 1.49 | 0.12 | 0.45 | 1.80 | 1.77 | 1.63 | 0.53 | 0.01 | 0.13 |
| Al2O3 | 17.06 | 16.41 | 16.88 | 15.94 | 15.98 | 16.65 | 16.46 | 16.17 | 19.49 | 15.06 |
| SiO2 | 59.24 | 57.59 | 67.64 | 65.29 | 57.66 | 57.27 | 56.63 | 65.18 | 66.12 | 68.67 |
| P2O5 | 0.50 | 0.51 | 0.01 | 0.23 | 0.57 | 0.45 | 0.50 | 0.26 | 0.07 | 0.03 |
| ClO2 | 0.34 | 0.48 | 0.26 | 0.25 | 0.48 | 0.43 | 0.39 | 0.38 | 0.05 | 0.41 |
| K2O | 6.93 | 6.31 | 6.03 | 6.80 | 6.08 | 6.02 | 5.94 | 6.80 | 7.69 | 6.17 |
| CaO | 2.97 | 2.71 | 1.48 | 1.47 | 3.11 | 3.50 | 3.35 | 1.66 | 1.29 | 1.05 |
| TiO2 | 0.58 | 0.58 | 0.04 | 0.25 | 0.63 | 0.60 | 0.53 | 0.40 | 0.02 | 0.20 |
| MnO | 0.16 | 0.15 | 0.00 | 0.09 | 0.16 | 0.23 | 0.15 | 0.06 | 0.00 | 0.04 |
| FeOt | 5.29 | 5.74 | 1.50 | 2.69 | 6.44 | 6.46 | 5.62 | 3.73 | 0.27 | 1.98 |
| Total | 98.84 | 96.81 | 98.96 | 97.48 | 97.60 | 98.53 | 96.09 | 99.67 | 99.88 | 97.85 |

| Date Analysed | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | AT1.w2.1 | AT1.w2.2 | AT1.w2.3 | AT1.w3.1 | AT1.w3.2 | AT1.w3.3 | AT1.w4.3 | AT1.w5.1 | AT1.w5.2 | AT1.w5.3 |
| Na2O | 4.79 | 3.77 | 4.67 | 3.56 | 3.66 | 3.73 | 5.00 | 3.39 | 3.39 | 4.57 |
| MgO | 0.02 | 0.19 | 0.11 | 0.21 | 0.20 | 0.17 | 0.08 | 0.20 | 0.18 | 0.16 |
| Al2O3 | 18.81 | 13.88 | 17.09 | 12.76 | 12.68 | 13.85 | 17.56 | 12.76 | 12.61 | 15.49 |
| SiO2 | 64.15 | 69.77 | 67.05 | 68.32 | 70.12 | 69.74 | 65.99 | 69.41 | 67.98 | 69.20 |
| P2O5 | 0.15 | 0.06 | 0.03 | 0.06 | 0.04 | 0.06 | 0.03 | 0.03 | 0.02 | 0.02 |
| ClO2 | 0.08 | 0.47 | 0.28 | 0.45 | 0.49 | 0.42 | 0.18 | 0.47 | 0.41 | 0.34 |
| K2O | 7.42 | 6.30 | 5.31 | 5.77 | 5.82 | 5.90 | 5.79 | 5.82 | 5.77 | 5.89 |
| CaO | 1.35 | 0.84 | 1.93 | 0.84 | 0.76 | 0.92 | 1.66 | 0.86 | 0.80 | 1.32 |
| TiO2 | 0.07 | 0.19 | 0.15 | 0.16 | 0.18 | 0.15 | 0.11 | 0.20 | 0.22 | 0.08 |
| MnO | 0.03 | 0.07 | 0.07 | 0.01 | 0.08 | 0.07 | 0.07 | 0.05 | 0.11 | 0.06 |
| FeOt | 0.68 | 2.23 | 1.73 | 2.51 | 2.32 | 2.09 | 1.05 | 2.59 | 2.53 | 1.78 |
| Total | 97.54 | 97.76 | 98.43 | 94.64 | 96.34 | 97.09 | 97.52 | 95.78 | 94.01 | 98.92 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | PClava.1.1 | PClava.1.2 | PClava.2.1 | PClava.2.2 | PClava.3.1 | PClava.3.2 | PClava.4.1 | PClava.4.2 | PClava.5.1 | PClava.5.2 |
| **Na2O** | 3.99 | 3.99 | 3.72 | 4.12 | 4.10 | 3.76 | 4.07 | 3.81 | 4.01 | 3.87 |
| **MgO** | 0.05 | 0.07 | 0.02 | 0.01 | 0.08 | 0.09 | 0.04 | 0.08 | 0.02 | 0.02 |
| **Al2O3** | 13.18 | 13.15 | 13.09 | 13.52 | 13.52 | 13.32 | 13.73 | 13.54 | 13.26 | 13.38 |
| **SiO2** | 73.07 | 73.39 | 73.74 | 73.51 | 73.24 | 73.06 | 73.54 | 72.78 | 73.50 | 73.89 |
| **P2O5** | 0.04 | 0.09 | 0.04 | 0.00 | 0.03 | 0.02 | 0.03 | 0.05 | 0.05 | 0.06 |
| **ClO2** | | | | | | | | | | |
| **K2O** | 5.41 | 5.45 | 5.75 | 5.44 | 5.58 | 5.79 | 5.25 | 5.73 | 5.63 | 5.67 |
| **CaO** | 0.73 | 0.78 | 0.68 | 0.76 | 0.73 | 0.82 | 0.72 | 0.87 | 0.73 | 0.68 |
| **TiO2** | 0.14 | 0.08 | 0.13 | 0.09 | 0.09 | 0.11 | 0.10 | 0.13 | 0.12 | 0.07 |
| **MnO** | 0.02 | 0.02 | 0.06 | 0.13 | 0.02 | 0.13 | 0.12 | 0.09 | 0.04 | 0.10 |
| **FeOt** | 1.67 | 1.71 | 1.53 | 1.52 | 1.64 | 1.80 | 1.52 | 1.75 | 1.49 | 1.66 |
| **Total** | 98.29 | 98.73 | 98.76 | 99.10 | 99.03 | 98.89 | 99.15 | 98.82 | 98.85 | 99.39 |
| **Date Analysed** | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | LPC1.1 | LPC1.1.1 | LPC1.1.2 | LPC1.1.3 | LPC1.10.1 | LPC1.10.2 | LPC1.10.3 | LPC1.10.4 | LPC1.2.1 | LPC1.2.2 |
| **Na2O** | 4.13 | 5.19 | 5.00 | 5.11 | 4.75 | 4.62 | 4.71 | 4.83 | 4.78 | 4.19 |
| **MgO** | 0.41 | 1.05 | 0.91 | 1.17 | 1.09 | 1.38 | 1.46 | 1.27 | 1.39 | 2.58 |
| **Al2O3** | 19.75 | 17.82 | 17.39 | 18.06 | 17.71 | 17.63 | 17.72 | 18.06 | 17.57 | 16.77 |
| **SiO2** | 61.57 | 58.30 | 58.29 | 58.91 | 59.35 | 58.46 | 58.02 | 58.11 | 58.10 | 56.98 |
| **P2O5** | 0.18 | 0.40 | 0.62 | 0.37 | 0.37 | 0.50 | 0.41 | 0.43 | 0.41 | 0.39 |
| **ClO2** | | | | | | | | | | |
| **K2O** | 7.86 | 7.21 | 7.06 | 7.05 | 6.99 | 6.99 | 6.86 | 6.89 | 6.97 | 5.99 |
| **CaO** | 2.96 | 2.87 | 2.61 | 2.92 | 2.89 | 3.43 | 3.43 | 3.16 | 3.31 | 5.41 |
| **TiO2** | 0.32 | 0.42 | 0.50 | 0.55 | 0.56 | 0.54 | 0.51 | 0.58 | 0.54 | 0.69 |
| **MnO** | 0.04 | 0.16 | 0.09 | 0.13 | 0.10 | 0.10 | 0.09 | 0.15 | 0.20 | 0.19 |
| **FeOt** | 2.82 | 5.61 | 5.17 | 5.33 | 5.56 | 5.78 | 5.67 | 5.27 | 6.00 | 6.09 |
| **Total** | 100.05 | 99.02 | 97.65 | 99.60 | 99.38 | 99.44 | 98.88 | 98.76 | 99.27 | 99.30 |
| **Date Analysed** | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | LPC1.2.3 | LPC1.2.4 | LPC1.3.1 | LPC1.3.2 | LPC1.3.3 | LPC1.3.4 | LPC1.4.1 | LPC1.4.2 | LPC1.4.3 | LPC1.4.4 |
| **Na2O** | 4.20 | 4.41 | 4.62 | 4.45 | 4.67 | 4.81 | 4.37 | 4.72 | 4.63 | 4.65 |
| **MgO** | 1.41 | 1.53 | 1.39 | 1.73 | 1.42 | 1.37 | 2.08 | 1.56 | 1.28 | 1.41 |
| **Al2O3** | 17.99 | 17.51 | 17.80 | 17.35 | 17.87 | 18.01 | 17.16 | 17.89 | 18.14 | 17.87 |
| **SiO2** | 58.62 | 58.33 | 58.01 | 58.11 | 58.18 | 58.17 | 57.59 | 58.04 | 58.37 | 58.03 |
| **P2O5** | 0.45 | 0.37 | 0.45 | 0.42 | 0.44 | 0.41 | 0.47 | 0.45 | 0.46 | 0.40 |
| **ClO2** | | | | | | | | | | |
| **K2O** | 6.93 | 6.84 | 6.99 | 6.76 | 6.88 | 6.91 | 6.47 | 6.75 | 6.79 | 6.91 |
| **CaO** | 3.46 | 3.49 | 3.21 | 3.98 | 3.34 | 3.32 | 4.46 | 3.53 | 3.41 | 3.29 |
| **TiO2** | 0.59 | 0.58 | 0.59 | 0.55 | 0.53 | 0.57 | 0.50 | 0.62 | 0.52 | 0.59 |
| **MnO** | 0.10 | 0.07 | 0.20 | 0.06 | 0.16 | 0.08 | 0.05 | 0.12 | 0.13 | 0.08 |
| **FeOt** | 5.91 | 6.09 | 5.47 | 5.80 | 5.66 | 5.70 | 6.09 | 5.74 | 5.85 | 5.91 |
| **Total** | 99.64 | 99.23 | 98.73 | 99.21 | 99.14 | 99.35 | 99.25 | 99.41 | 99.58 | 99.15 |
| **Date Analysed** | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | LPC1.5.1 | LPC1.5.2 | LPC1.6.1 | LPC1.6.2 | LPC1.6.3 | LPC1.7.1 | LPC1.7.3 | LPC1.7.4 | LPC1.8.1 | LPC1.8.2 |
| **Na2O** | 4.81 | 4.70 | 4.75 | 4.61 | 4.72 | 4.42 | 4.57 | 4.58 | 4.68 | 4.29 |
| **MgO** | 1.39 | 1.49 | 1.39 | 1.39 | 1.28 | 1.34 | 1.39 | 1.37 | 1.10 | 1.13 |
| **Al2O3** | 16.58 | 18.01 | 17.74 | 17.98 | 18.07 | 17.85 | 17.89 | 17.76 | 18.09 | 18.45 |
| **SiO2** | 56.05 | 58.66 | 57.77 | 58.39 | 58.42 | 58.45 | 58.61 | 58.61 | 59.41 | 59.46 |
| **P2O5** | 0.33 | 0.44 | 0.45 | 0.38 | 0.44 | 0.39 | 0.44 | 0.37 | 0.31 | 0.49 |
| **ClO2** | | | | | | | | | | |
| **K2O** | 6.60 | 6.60 | 6.98 | 6.86 | 6.74 | 6.81 | 6.85 | 6.87 | 7.28 | 7.18 |
| **CaO** | 3.53 | 3.45 | 3.40 | 3.59 | 3.50 | 3.33 | 3.29 | 3.20 | 3.04 | 3.35 |
| **TiO2** | 0.52 | 0.63 | 0.63 | 0.58 | 0.53 | 0.60 | 0.63 | 0.56 | 0.50 | 0.50 |
| **MnO** | 0.15 | 0.23 | 0.16 | 0.00 | 0.10 | 0.16 | 0.00 | 0.12 | 0.25 | 0.12 |
| **FeOt** | 5.33 | 5.83 | 5.52 | 5.60 | 5.45 | 5.65 | 5.72 | 5.69 | 5.34 | 4.59 |
| **Total** | 95.29 | 100.04 | 98.79 | 99.39 | 99.25 | 99.00 | 99.40 | 99.13 | 100.00 | 99.56 |

| Date Analysed | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | LPC1.8.3 | LPC1.8.4 | LPC1.9.1 | LPC1.9.2 | LPC1.9.3 | LPC1.9.4 | LPC2.1.2 | LPC2.1.3 | LPC2.10.1 | LPC2.10.2 |
| Na2O | 4.73 | 4.67 | 4.84 | 4.83 | 4.86 | 4.85 | 4.32 | 4.57 | 4.80 | 4.54 |
| MgO | 1.40 | 1.36 | 1.23 | 1.39 | 1.25 | 1.27 | 0.78 | 0.68 | 0.76 | 0.79 |
| Al2O3 | 17.73 | 17.90 | 17.76 | 17.96 | 18.00 | 18.22 | 17.86 | 18.54 | 18.25 | 17.76 |
| SiO2 | 58.08 | 58.02 | 58.57 | 57.81 | 57.73 | 56.63 | 59.83 | 59.45 | 60.22 | 59.60 |
| P2O5 | 0.37 | 0.39 | 0.37 | 0.45 | 0.69 | 0.36 | 0.35 | 0.25 | 0.28 | 0.33 |
| ClO2 | | | | | | | | | | |
| K2O | 6.99 | 6.88 | 6.80 | 7.10 | 7.08 | 6.86 | 7.41 | 7.63 | 7.05 | 7.31 |
| CaO | 3.33 | 3.43 | 3.44 | 3.20 | 3.30 | 3.21 | 2.27 | 2.44 | 2.50 | 2.38 |
| TiO2 | 0.62 | 0.55 | 0.61 | 0.52 | 0.53 | 0.52 | 0.41 | 0.43 | 0.52 | 0.49 |
| MnO | 0.03 | 0.09 | 0.08 | 0.09 | 0.17 | 0.14 | 0.06 | 0.11 | 0.13 | 0.02 |
| FeOt | 5.60 | 5.60 | 5.18 | 5.73 | 5.31 | 5.93 | 4.18 | 4.03 | 4.48 | 4.21 |
| Total | 98.89 | 98.89 | 98.88 | 99.09 | 98.93 | 97.98 | 97.46 | 98.12 | 98.99 | 97.44 |
| Date Analysed | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | LPC2.10.3 | LPC2.2.1 | LPC2.2.2 | LPC2.2.3 | LPC2.3.1 | LPC2.3.2 | LPC2.4.1 | LPC2.4.2 | LPC2.6.1 | LPC2.6.3 |
| Na2O | 4.95 | 4.25 | 5.00 | 4.70 | 4.72 | 4.85 | 5.09 | 5.24 | 5.17 | 5.16 |
| MgO | 0.86 | 0.87 | 0.83 | 0.80 | 0.76 | 0.73 | 1.05 | 1.03 | 1.06 | 1.00 |
| Al2O3 | 17.75 | 17.78 | 17.50 | 18.12 | 17.77 | 17.94 | 17.84 | 17.50 | 17.91 | 17.89 |
| SiO2 | 59.77 | 59.54 | 59.50 | 59.39 | 59.93 | 59.60 | 59.59 | 59.25 | 58.74 | 59.67 |
| P2O5 | 0.35 | 0.36 | 0.43 | 0.28 | 0.49 | 0.38 | 0.35 | 0.37 | 0.40 | 0.39 |
| ClO2 | | | | | | | | | | |
| K2O | 7.41 | 7.20 | 7.23 | 7.06 | 7.36 | 7.27 | 7.00 | 7.00 | 7.08 | 7.20 |
| CaO | 2.43 | 2.56 | 2.37 | 2.45 | 2.54 | 2.26 | 2.50 | 2.49 | 2.54 | 2.55 |
| TiO2 | 0.53 | 0.52 | 0.57 | 0.58 | 0.51 | 0.48 | 0.55 | 0.58 | 0.51 | 0.54 |
| MnO | 0.05 | 0.14 | 0.08 | 0.07 | 0.22 | 0.14 | 0.14 | 0.12 | 0.07 | 0.14 |
| FeOt | 4.75 | 4.60 | 4.95 | 4.78 | 4.61 | 4.65 | 5.64 | 5.35 | 5.43 | 5.46 |
| Total | 98.84 | 97.80 | 98.46 | 98.22 | 98.90 | 98.30 | 99.74 | 98.93 | 98.90 | 100.01 |
| Date Analysed | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.10.20 | 10.10.20 | 10.10.20 |
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Commenda | Commenda | Commenda |
| Label | LPC2.7.1 | LPC2.8.1 | LPC2.8.2 | LPC2.8.3 | LPC2.9.1 | LPC2.9.2 | LPC2.9.3 | S38e.1.1 | S38e.1.2 | S38e.1.3 |
| Na2O | 5.10 | 4.31 | 4.32 | 4.55 | 4.52 | 4.91 | 4.86 | 4.39 | 4.09 | 4.08 |
| MgO | 0.75 | 0.97 | 0.95 | 0.82 | 0.75 | 0.92 | 0.92 | 0.10 | 0.05 | 0.06 |
| Al2O3 | 17.86 | 17.31 | 17.09 | 17.68 | 17.94 | 17.50 | 17.13 | 14.25 | 13.64 | 13.59 |
| SiO2 | 58.70 | 58.70 | 58.67 | 59.06 | 59.74 | 58.76 | 58.66 | 71.71 | 73.10 | 72.93 |
| P2O5 | 0.37 | 0.37 | 0.42 | 0.31 | 0.29 | 0.63 | 0.53 | 0.04 | 0.02 | 0.06 |
| ClO2 | | | | | | | | 0.28 | 0.33 | 0.28 |
| K2O | 7.50 | 6.81 | 6.98 | 7.12 | 7.28 | 7.17 | 6.55 | 5.42 | 5.72 | 5.66 |
| CaO | 2.39 | 2.61 | 2.88 | 2.41 | 2.25 | 2.58 | 2.55 | 0.88 | 0.58 | 0.71 |
| TiO2 | 0.43 | 0.59 | 0.73 | 0.54 | 0.51 | 0.54 | 0.60 | 0.24 | 0.14 | 0.13 |
| MnO | 0.12 | 0.09 | 0.02 | 0.21 | 0.02 | 0.18 | 0.18 | 0.01 | 0.08 | 0.00 |
| FeOt | 4.07 | 5.50 | 5.75 | 5.50 | 4.76 | 5.01 | 5.50 | 1.74 | 1.82 | 1.62 |
| Total | 97.29 | 97.25 | 97.81 | 98.21 | 98.06 | 98.21 | 97.50 | 99.05 | 99.57 | 99.13 |
| Date Analysed | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
| Eruptive Unit | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| Label | S38e.10.1 | S38e.10.2 | S38e.11.1 | S38e.11.2 | S38e.11.3 | S38e.12.1 | S38e.12.2 | S38e.13.1 | S38e.13.2 | S38e.14.1 |
| Na2O | 3.55 | 3.87 | 3.98 | 4.09 | 3.88 | 3.87 | 3.82 | 3.77 | 3.90 | 3.80 |
| MgO | 0.03 | 0.07 | 0.08 | 0.09 | 0.09 | 0.05 | 0.04 | 0.05 | 0.08 | 0.05 |
| Al2O3 | 13.29 | 13.61 | 13.64 | 13.55 | 14.12 | 13.64 | 13.31 | 13.62 | 13.53 | 13.82 |
| SiO2 | 74.05 | 72.60 | 72.81 | 73.14 | 73.03 | 73.52 | 71.81 | 73.37 | 73.69 | 74.14 |
| P2O5 | 0.04 | 0.06 | 0.01 | 0.03 | 0.04 | 0.06 | 0.02 | 0.02 | 0.01 | 0.04 |
| ClO2 | 0.25 | 0.33 | 0.29 | 0.33 | 0.32 | 0.30 | 0.32 | 0.34 | 0.30 | 0.33 |
| K2O | 6.06 | 5.92 | 5.78 | 5.64 | 5.59 | 5.84 | 5.81 | 5.96 | 5.96 | 5.74 |
| CaO | 0.52 | 0.61 | 0.59 | 0.70 | 0.67 | 0.65 | 0.62 | 0.56 | 0.63 | 0.57 |
| TiO2 | 0.15 | 0.09 | 0.10 | 0.12 | 0.13 | 0.15 | 0.13 | 0.13 | 0.11 | 0.13 |
| MnO | 0.08 | 0.11 | 0.07 | 0.08 | 0.04 | 0.02 | 0.06 | 0.04 | 0.05 | 0.03 |
| FeOt | 1.51 | 1.65 | 1.73 | 1.78 | 1.82 | 1.78 | 1.85 | 1.71 | 1.63 | 1.75 |
| Total | 99.53 | 98.92 | 99.08 | 99.55 | 99.72 | 99.88 | 97.80 | 99.56 | 99.89 | 100.39 |

| Date Analysed | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| Label | S38e.14.2 | S38e.15.1 | S38e.15.2 | S38e.15.3 | S38e.2.1 | S38e.2.2 | S38e.3.1 | S38e.3.2 | S38e.4.1 | S38e.4.2 |
| Na2O | 3.69 | 4.42 | 3.75 | 4.07 | 3.99 | 4.06 | 3.90 | 3.80 | 4.61 | 4.07 |
| MgO | 0.03 | 0.05 | 0.07 | 0.06 | 0.08 | 0.04 | 0.05 | 0.08 | 0.04 | 0.08 |
| Al2O3 | 13.54 | 13.61 | 13.75 | 13.67 | 13.58 | 13.69 | 13.31 | 13.21 | 14.02 | 13.19 |
| SiO2 | 73.78 | 72.88 | 73.58 | 72.98 | 73.19 | 73.56 | 73.68 | 73.30 | 72.44 | 73.30 |
| P2O5 | 0.01 | 0.08 | 0.04 | 0.01 | 0.03 | 0.03 | 0.07 | 0.03 | 0.05 | 0.03 |
| ClO2 | 0.27 | 0.28 | 0.31 | 0.34 | 0.34 | 0.32 | 0.29 | 0.27 | 0.20 | 0.27 |
| K2O | 5.86 | 5.29 | 5.87 | 6.12 | 5.69 | 5.70 | 5.64 | 5.66 | 5.04 | 5.57 |
| CaO | 0.50 | 0.58 | 0.54 | 0.58 | 0.66 | 0.62 | 0.67 | 0.59 | 0.82 | 0.72 |
| TiO2 | 0.11 | 0.10 | 0.13 | 0.16 | 0.13 | 0.18 | 0.10 | 0.11 | 0.17 | 0.11 |
| MnO | 0.05 | 0.07 | 0.09 | 0.10 | 0.03 | 0.07 | 0.01 | 0.08 | 0.10 | 0.05 |
| FeOt | 1.59 | 1.98 | 1.76 | 1.69 | 1.87 | 1.84 | 1.66 | 1.72 | 1.58 | 1.60 |
| Total | 99.43 | 99.33 | 99.89 | 99.77 | 99.57 | 100.10 | 99.38 | 98.83 | 99.07 | 98.99 |

| Date Analysed | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| Label | S38e.5.1 | S38e.5.2 | S38e.6.1 | S38e.6.2 | S38e.6.3 | S38e.7.1 | S38e.7.2 | S38e.8.1 | S38e.8.2 | S38e.8.3 |
| Na2O | 3.89 | 3.98 | 3.60 | 3.89 | 3.78 | 3.54 | 4.27 | 3.84 | 3.68 | 3.81 |
| MgO | 0.02 | 0.08 | 0.09 | 0.07 | 0.04 | 0.06 | 0.05 | 0.03 | 0.08 | 0.07 |
| Al2O3 | 13.74 | 13.69 | 13.75 | 13.36 | 13.45 | 13.82 | 14.23 | 13.43 | 13.79 | 13.59 |
| SiO2 | 72.46 | 73.31 | 74.09 | 73.72 | 73.90 | 73.24 | 72.64 | 73.84 | 73.51 | 72.39 |
| P2O5 | 0.06 | 0.02 | 0.02 | 0.29 | 0.02 | 0.02 | 0.05 | 0.02 | 0.07 | 0.24 |
| ClO2 | 0.34 | 0.33 | 0.30 | 0.27 | 0.28 | 0.29 | 0.28 | 0.29 | 0.34 | 0.34 |
| K2O | 5.90 | 5.76 | 5.70 | 5.77 | 6.04 | 5.97 | 5.68 | 5.87 | 5.86 | 5.87 |
| CaO | 0.57 | 0.69 | 0.59 | 0.84 | 0.58 | 0.54 | 0.69 | 0.50 | 0.58 | 0.85 |
| TiO2 | 0.15 | 0.18 | 0.12 | 0.06 | 0.11 | 0.08 | 0.13 | 0.10 | 0.09 | 0.09 |
| MnO | 0.07 | 0.00 | 0.02 | 0.02 | 0.01 | 0.08 | 0.02 | 0.09 | 0.14 | 0.07 |
| FeOt | 1.64 | 1.93 | 1.67 | 1.80 | 1.69 | 1.73 | 1.61 | 1.72 | 1.72 | 1.83 |
| Total | 98.83 | 99.97 | 99.93 | 100.08 | 99.89 | 99.36 | 99.64 | 99.74 | 99.88 | 99.14 |

| Date Analysed | 10.10.20 | 10.10.20 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| Label | S38e.9.1 | S38e.9.2 | CA5.1 | CA5.10 | CA5.11 | CA5.12 | CA5.13 | CA5.14 | CA5.15 | CA5.16 |
| Na2O | 4.77 | 3.89 | 4.69 | 4.45 | 4.31 | 4.43 | 4.41 | 4.17 | 4.77 | 4.54 |
| MgO | 0.04 | 0.04 | 1.09 | 1.14 | 1.10 | 1.21 | 1.17 | 1.14 | 1.18 | 1.19 |
| Al2O3 | 13.69 | 13.52 | 17.25 | 17.71 | 17.32 | 17.35 | 17.08 | 17.74 | 17.44 | 17.38 |
| SiO2 | 73.40 | 73.30 | 60.16 | 59.73 | 60.29 | 59.93 | 60.22 | 60.07 | 59.53 | 60.74 |
| P2O5 | 0.05 | 0.07 | 0.32 | 0.38 | 0.35 | 0.30 | 0.33 | 0.33 | 0.35 | 0.31 |
| ClO2 | 0.36 | 0.34 | 0.26 | 0.32 | 0.33 | 0.36 | 0.34 | 0.34 | 0.36 | 0.31 |
| K2O | 4.66 | 5.96 | 7.00 | 7.12 | 6.82 | 6.93 | 6.94 | 7.04 | 6.93 | 6.98 |
| CaO | 0.60 | 0.65 | 2.73 | 2.86 | 2.83 | 2.86 | 2.90 | 3.02 | 2.86 | 2.79 |
| TiO2 | 0.11 | 0.11 | 0.55 | 0.50 | 0.51 | 0.56 | 0.50 | 0.53 | 0.50 | 0.51 |
| MnO | 0.06 | 0.12 | 0.15 | 0.18 | 0.16 | 0.15 | 0.13 | 0.10 | 0.23 | 0.15 |
| FeOt | 1.67 | 2.02 | 4.65 | 5.09 | 5.04 | 4.81 | 5.20 | 5.10 | 5.15 | 4.97 |
| Total | 99.42 | 100.00 | 98.85 | 99.48 | 99.05 | 98.88 | 99.22 | 99.58 | 99.31 | 99.87 |

| Date Analysed | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| Label | CA5.17 | CA5.18 | CA5.19 | CA5.20 | CA5.21 | CA5.22 | CA5.23 | CA5.24 | CA5.26 | CA5.5 |
| Na2O | 4.39 | 4.46 | 4.52 | 4.56 | 4.47 | 4.34 | 4.20 | 4.45 | 4.25 | 4.60 |
| MgO | 1.18 | 1.12 | 1.17 | 1.18 | 1.20 | 1.28 | 1.12 | 1.22 | 1.27 | 1.15 |
| Al2O3 | 17.91 | 17.30 | 17.33 | 16.68 | 17.05 | 17.26 | 17.77 | 16.78 | 17.01 | 17.13 |
| SiO2 | 60.47 | 60.28 | 59.76 | 59.89 | 59.79 | 59.85 | 61.13 | 60.29 | 59.72 | 59.57 |
| P2O5 | 0.33 | 0.34 | 0.33 | 0.33 | 0.34 | 0.32 | 0.34 | 0.34 | 0.36 | 0.30 |
| ClO2 | 0.40 | 0.36 | 0.38 | 0.37 | 0.42 | 0.37 | 0.34 | 0.38 | 0.37 | 0.37 |
| K2O | 7.00 | 7.12 | 7.00 | 7.00 | 6.93 | 6.92 | 7.00 | 6.93 | 7.05 | 6.93 |
| CaO | 3.04 | 2.76 | 2.91 | 2.88 | 2.84 | 2.95 | 3.05 | 2.96 | 2.91 | 2.87 |
| TiO2 | 0.60 | 0.52 | 0.53 | 0.52 | 0.48 | 0.44 | 0.54 | 0.44 | 0.57 | 0.47 |
| MnO | 0.22 | 0.11 | 0.11 | 0.14 | 0.12 | 0.11 | 0.09 | 0.08 | 0.13 | 0.12 |
| FeOt | 4.88 | 5.07 | 4.91 | 4.89 | 5.16 | 5.14 | 4.95 | 5.08 | 5.02 | 4.98 |
| Total | 100.43 | 99.44 | 98.95 | 98.44 | 98.81 | 98.98 | 100.52 | 98.95 | 98.64 | 98.49 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.11.23 | 10.11.23 | 10.11.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.10.20 | 10.10.20 |
| **Eruptive Unit** | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | M.Pilato | M.Pilato |
| **Label** | CA5.7 | CA5.8 | CA5.9 | AT14.1.1 | AT14.3.1 | AT14.3.2 | AT14.3.3 | AT14.2.1 | AT15.1.1 | AT15.10.1 |
| **Na2O** | 4.26 | 4.68 | 4.53 | 4.65 | 2.32 | 2.70 | 3.17 | 1.97 | 3.79 | 2.86 |
| **MgO** | 1.14 | 1.17 | 1.19 | 0.00 | 0.07 | 0.07 | 0.05 | 0.07 | 0.05 | 2.21 |
| **Al2O3** | 18.12 | 17.48 | 17.11 | 13.98 | 13.60 | 12.70 | 13.27 | 13.21 | 16.15 | 18.29 |
| **SiO2** | 60.61 | 59.82 | 59.69 | 73.74 | 71.88 | 74.36 | 72.67 | 73.31 | 66.52 | 56.10 |
| **P2O5** | 0.36 | 0.32 | 0.35 | 0.00 | 0.03 | 0.00 | 0.03 | 0.08 | 0.03 | 0.60 |
| **ClO2** | 0.36 | 0.32 | 0.33 | 0.05 | 0.11 | 0.19 | 0.18 | 0.04 | 0.02 | 0.30 |
| **K2O** | 6.84 | 6.91 | 6.82 | 4.99 | 8.94 | 7.11 | 7.18 | 8.66 | 6.78 | 5.13 |
| **CaO** | 2.83 | 2.91 | 2.89 | 0.65 | 0.45 | 0.42 | 0.84 | 0.40 | 0.89 | 5.19 |
| **TiO2** | 0.46 | 0.50 | 0.53 | 0.02 | 0.06 | 0.11 | 0.08 | 0.10 | 0.16 | 0.68 |
| **MnO** | 0.05 | 0.16 | 0.15 | 0.10 | 0.00 | 0.21 | 0.03 | 0.09 | 0.04 | 0.06 |
| **FeOt** | 4.83 | 4.83 | 4.77 | 1.75 | 1.50 | 1.65 | 1.78 | 1.94 | 1.38 | 6.85 |
| **Total** | 99.86 | 99.10 | 98.36 | 99.93 | 98.95 | 99.51 | 99.29 | 99.87 | 95.80 | 98.27 |
| **Date Analysed** | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato |
| **Label** | AT15.10.2 | AT15.11.2 | AT15.11.3 | AT15.12.1 | AT15.12.2 | AT15.13.2 | AT15.14.1 | AT15.14.2 | AT15.14.3 | AT15.15.1 |
| **Na2O** | 2.33 | 3.75 | 3.59 | 4.75 | 3.82 | 1.42 | 1.59 | 4.06 | 4.23 | 1.18 |
| **MgO** | 2.29 | 0.02 | 0.34 | 1.81 | 0.05 | 2.32 | 2.97 | 0.02 | 1.40 | 2.65 |
| **Al2O3** | 18.25 | 12.07 | 14.32 | 18.53 | 12.45 | 18.34 | 18.64 | 12.41 | 18.15 | 18.30 |
| **SiO2** | 56.34 | 71.00 | 67.28 | 58.55 | 72.70 | 57.19 | 56.88 | 71.72 | 56.09 | 56.85 |
| **P2O5** | 0.57 | 0.00 | 0.06 | 0.52 | 0.02 | 0.57 | 0.61 | 0.00 | 0.53 | 0.57 |
| **ClO2** | 0.23 | 0.41 | 0.43 | 0.00 | 0.37 | 0.31 | 0.35 | 0.36 | 0.06 | 0.32 |
| **K2O** | 6.49 | 4.77 | 6.45 | 5.76 | 5.04 | 3.92 | 4.17 | 4.90 | 7.53 | 3.96 |
| **CaO** | 3.66 | 0.69 | 1.21 | 3.74 | 0.71 | 4.62 | 4.65 | 0.76 | 3.79 | 5.79 |
| **TiO2** | 0.68 | 0.10 | 0.27 | 0.60 | 0.08 | 0.70 | 0.72 | 0.07 | 0.70 | 0.73 |
| **MnO** | 0.13 | 0.07 | 0.15 | 0.25 | 0.00 | 0.12 | 0.22 | 0.08 | 0.13 | 0.19 |
| **FeOt** | 7.15 | 1.46 | 3.36 | 4.92 | 1.66 | 6.91 | 7.54 | 1.52 | 4.17 | 7.66 |
| **Total** | 98.13 | 94.34 | 97.48 | 99.43 | 96.89 | 96.40 | 98.34 | 95.91 | 96.78 | 98.20 |
| **Date Analysed** | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato |
| **Label** | AT15.2.2 | AT15.3.1 | AT15.3.3 | AT15.4.2 | AT15.5.1 | AT15.5.2 | AT15.6.1 | AT15.6.2 | AT15.7.1 | AT15.7.2 |
| **Na2O** | 4.88 | 1.32 | 4.00 | 3.10 | 2.72 | 3.62 | 1.59 | 3.51 | 4.13 | 3.48 |
| **MgO** | 0.00 | 2.35 | 0.04 | 1.62 | 2.37 | 0.03 | 0.56 | 1.30 | 0.18 | 0.03 |
| **Al2O3** | 17.91 | 19.45 | 13.27 | 17.95 | 18.52 | 12.47 | 14.97 | 19.67 | 18.90 | 12.30 |
| **SiO2** | 65.97 | 58.07 | 74.07 | 59.13 | 56.85 | 71.54 | 63.91 | 59.39 | 65.25 | 70.70 |
| **P2O5** | 0.00 | 0.61 | 0.00 | 0.60 | 0.56 | 0.00 | 0.14 | 0.63 | 0.04 | 0.01 |
| **ClO2** | 0.00 | 0.30 | 0.44 | 0.31 | 0.33 | 0.45 | 0.47 | 0.02 | 0.01 | 0.39 |
| **K2O** | 8.09 | 4.17 | 4.95 | 5.07 | 4.33 | 5.05 | 6.36 | 6.43 | 9.46 | 4.93 |
| **CaO** | 0.83 | 5.44 | 0.72 | 3.74 | 4.72 | 0.71 | 1.55 | 2.88 | 0.68 | 0.73 |
| **TiO2** | 0.01 | 0.66 | 0.08 | 0.65 | 0.64 | 0.07 | 0.41 | 0.63 | 0.13 | 0.03 |
| **MnO** | 0.00 | 0.14 | 0.04 | 0.17 | 0.16 | 0.01 | 0.02 | 0.19 | 0.05 | 0.08 |
| **FeOt** | 0.48 | 7.17 | 1.80 | 6.74 | 7.54 | 1.65 | 3.78 | 4.94 | 0.41 | 1.56 |
| **Total** | 98.17 | 99.68 | 99.43 | 99.09 | 98.74 | 95.60 | 93.75 | 99.60 | 99.25 | 94.24 |
| **Date Analysed** | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato |
| **Label** | AT15.7.3 | AT15.8.1 | AT15.8.3 | AT15.9.1 | 14PLB.1.2 | 14PLB.10. | 14PLB.10. | 14PLB.11. | 14PLB.11. | 14PLB.12. |
| **Na2O** | 7.14 | 1.09 | 6.75 | 4.06 | 3.44 | 3.50 | 4.72 | 4.59 | 3.46 | 3.09 |
| **MgO** | 0.38 | 2.35 | 1.70 | 0.04 | 0.06 | 0.08 | 0.03 | 0.02 | 0.05 | 0.04 |
| **Al2O3** | 21.56 | 19.07 | 18.62 | 12.53 | 12.56 | 12.52 | 16.03 | 15.00 | 13.21 | 12.50 |
| **SiO2** | 58.81 | 59.35 | 57.40 | 71.41 | 70.29 | 70.19 | 68.27 | 72.17 | 67.23 | 69.70 |
| **P2O5** | 0.09 | 0.54 | 0.56 | 0.01 | 0.00 | 0.04 | 0.06 | 0.00 | 0.04 | 0.01 |
| **ClO2** | 0.03 | 0.38 | 0.24 | 0.37 | 0.40 | 0.39 | 0.01 | 0.05 | 0.47 | 0.37 |
| **K2O** | 1.82 | 4.25 | 1.69 | 4.73 | 5.50 | 5.52 | 7.53 | 5.49 | 6.24 | 5.85 |
| **CaO** | 4.27 | 3.75 | 5.80 | 0.72 | 0.61 | 0.69 | 0.60 | 0.61 | 0.36 | 0.66 |
| **TiO2** | 0.36 | 0.66 | 0.70 | 0.07 | 0.10 | 0.05 | 0.03 | 0.05 | 0.14 | 0.11 |
| **MnO** | 0.03 | 0.17 | 0.17 | 0.03 | 0.08 | 0.08 | 0.04 | 0.00 | 0.01 | 0.00 |
| **FeOt** | 0.94 | 7.12 | 6.27 | 1.61 | 1.63 | 1.62 | 0.65 | 0.44 | 2.43 | 1.69 |
| **Total** | 95.43 | 98.71 | 99.89 | 95.59 | 94.67 | 94.68 | 97.97 | 98.42 | 93.65 | 94.01 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato |
| **Label** | 14PLB.13. | 14PLB.14. | 14PLB.14. | 14PLB.2.1 | 14PLB.2.2 | 14PLB.2.3 | 14PLB.3.2 | 14PLB.3.3 | 14PLB.4.1 | 14PLB.5.2 |
| **Na2O** | 2.10 | 3.21 | 3.11 | 3.01 | 3.10 | 2.00 | 3.87 | 2.82 | 3.68 | 2.28 |
| **MgO** | 0.04 | 0.03 | 0.04 | 0.03 | 0.06 | 0.06 | 0.05 | 0.03 | 0.00 | 0.05 |
| **Al2O3** | 12.83 | 12.31 | 12.95 | 12.19 | 12.10 | 12.35 | 13.27 | 12.61 | 14.70 | 12.19 |
| **SiO2** | 69.74 | 69.24 | 70.08 | 68.58 | 69.38 | 70.11 | 71.88 | 70.25 | 70.34 | 70.17 |
| **P2O5** | 0.00 | 0.10 | 0.05 | 0.05 | 0.02 | 0.04 | 0.00 | 0.00 | 0.04 | 0.01 |
| **ClO2** | 0.39 | 0.39 | 0.31 | 0.43 | 0.36 | 0.42 | 0.28 | 0.39 | 0.18 | 0.51 |
| **K2O** | 5.73 | 5.77 | 5.32 | 6.02 | 5.31 | 5.71 | 5.80 | 5.73 | 5.55 | 5.20 |
| **CaO** | 0.80 | 0.72 | 0.72 | 0.78 | 0.79 | 0.72 | 0.64 | 0.67 | 0.76 | 0.71 |
| **TiO2** | 0.13 | 0.09 | 0.10 | 0.10 | 0.18 | 0.10 | 0.11 | 0.06 | 0.07 | 0.10 |
| **MnO** | 0.11 | 0.02 | 0.06 | 0.09 | 0.04 | 0.14 | 0.02 | 0.12 | 0.00 | 0.12 |
| **FeOt** | 1.75 | 1.59 | 1.41 | 1.77 | 1.70 | 1.63 | 1.15 | 1.65 | 1.34 | 1.90 |
| **Total** | 93.62 | 93.48 | 94.14 | 93.06 | 93.03 | 93.28 | 97.06 | 94.33 | 96.65 | 93.25 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 |
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | 14PLB.5.3 | 14PLB.6.3 | 14PLB.7.1 | 14PLB.8.1 | 14PLB.9.1 | RVULC07 | RVULC07 | RVULC07 | RVULC07 | RVULC07 |
| **Na2O** | 1.79 | 2.75 | 3.00 | 2.42 | 4.14 | 4.40 | 4.88 | 5.15 | 5.27 | 5.11 |
| **MgO** | 0.04 | 0.04 | 0.04 | 0.03 | 0.00 | 0.79 | 0.73 | 0.77 | 0.72 | 0.78 |
| **Al2O3** | 12.50 | 12.57 | 13.56 | 13.85 | 13.69 | 17.22 | 16.57 | 16.25 | 15.72 | 16.18 |
| **SiO2** | 69.85 | 71.60 | 70.78 | 70.14 | 73.42 | 63.95 | 62.72 | 61.40 | 62.52 | 61.94 |
| **P2O5** | 0.03 | 0.00 | 0.02 | 0.04 | 0.00 | 0.23 | 0.21 | 0.20 | 0.20 | 0.22 |
| **ClO2** | 0.39 | 0.20 | 0.30 | 0.35 | 0.05 | 0.31 | 0.41 | 0.45 | 0.47 | 0.27 |
| **K2O** | 6.02 | 5.54 | 4.53 | 5.07 | 6.04 | 6.90 | 6.48 | 6.26 | 6.18 | 7.01 |
| **CaO** | 0.69 | 0.47 | 0.75 | 0.72 | 0.39 | 1.76 | 1.75 | 1.65 | 1.67 | 1.49 |
| **TiO2** | 0.11 | 0.10 | 0.08 | 0.18 | 0.05 | 0.44 | 0.43 | 0.41 | 0.47 | 0.43 |
| **MnO** | 0.07 | 0.05 | 0.00 | 0.12 | 0.00 | 0.14 | 0.18 | 0.10 | 0.10 | 0.05 |
| **FeOt** | 1.86 | 1.09 | 1.26 | 1.32 | 0.49 | 4.23 | 4.28 | 4.42 | 4.51 | 3.77 |
| **Total** | 93.33 | 94.40 | 94.31 | 94.24 | 98.28 | 100.37 | 98.63 | 97.06 | 97.82 | 97.24 |
| **Date Analysed** | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | RVULC07 | RVULC07 | RVULC07 | RVULC07 | RVULC07 | RVULC07 | RVULC07 | RVULC07 | RVULC07 | RVULC24. |
| **Na2O** | 4.36 | 4.72 | 4.27 | 4.81 | 4.43 | 4.58 | 4.59 | 4.56 | 4.85 | 5.22 |
| **MgO** | 0.65 | 0.67 | 0.70 | 0.48 | 0.58 | 0.71 | 0.71 | 0.81 | 0.77 | 0.73 |
| **Al2O3** | 16.05 | 15.91 | 16.92 | 16.99 | 15.99 | 16.45 | 16.73 | 16.40 | 16.96 | 15.36 |
| **SiO2** | 63.97 | 63.38 | 63.69 | 63.85 | 62.27 | 62.69 | 63.58 | 62.43 | 63.81 | 63.35 |
| **P2O5** | 0.12 | 0.12 | 0.20 | 0.22 | 0.23 | 0.18 | 0.24 | 0.21 | 0.21 | 0.22 |
| **ClO2** | 0.48 | 0.45 | 0.46 | 0.37 | 0.25 | 0.42 | 0.43 | 0.33 | 0.28 | 0.55 |
| **K2O** | 6.62 | 6.47 | 6.68 | 7.13 | 6.96 | 6.74 | 6.69 | 6.95 | 7.07 | 5.81 |
| **CaO** | 1.63 | 1.61 | 1.72 | 1.30 | 1.58 | 1.70 | 1.74 | 1.66 | 1.57 | 1.80 |
| **TiO2** | 0.30 | 0.38 | 0.43 | 0.49 | 0.43 | 0.46 | 0.39 | 0.42 | 0.43 | 0.50 |
| **MnO** | 0.17 | 0.11 | 0.17 | 0.02 | 0.07 | 0.09 | 0.14 | 0.19 | 0.19 | 0.20 |
| **FeOt** | 4.33 | 4.42 | 4.35 | 2.83 | 3.52 | 4.70 | 4.81 | 3.88 | 4.01 | 5.28 |
| **Total** | 98.68 | 98.24 | 99.59 | 98.49 | 96.31 | 98.72 | 100.04 | 97.83 | 100.14 | 99.01 |
| **Date Analysed** | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | RVULC41. | RVULC41. | RVULC41. | RVULC41. | RVULC41. | RVULC41. | RVULC41. | RVULC41. | RVULC41. | RVULC41. |
| **Na2O** | 5.19 | 3.65 | 5.73 | 4.62 | 4.64 | 4.72 | 5.47 | 6.28 | 4.51 | 4.40 |
| **MgO** | 0.00 | 0.29 | 0.05 | 0.00 | 0.02 | 0.00 | 0.05 | 0.02 | 0.02 | 0.01 |
| **Al2O3** | 20.09 | 15.14 | 22.27 | 20.89 | 19.17 | 19.95 | 23.66 | 23.18 | 19.06 | 20.24 |
| **SiO2** | 61.74 | 63.84 | 61.54 | 62.93 | 65.06 | 64.43 | 60.08 | 60.76 | 64.96 | 64.11 |
| **P2O5** | 0.21 | 0.25 | 0.05 | 0.03 | 0.04 | 0.03 | 0.02 | 0.01 | 0.02 | 0.05 |
| **ClO2** | 0.02 | 0.49 | 0.03 | 0.00 | 0.04 | 0.00 | 0.03 | 0.02 | 0.01 | 0.01 |
| **K2O** | 7.23 | 6.39 | 4.24 | 7.29 | 8.56 | 8.25 | 3.59 | 2.36 | 9.22 | 8.51 |
| **CaO** | 2.53 | 1.34 | 4.40 | 2.56 | 1.28 | 1.66 | 6.10 | 5.93 | 1.13 | 1.86 |
| **TiO2** | 0.12 | 0.55 | 0.09 | 0.07 | 0.15 | 0.14 | 0.08 | 0.07 | 0.08 | 0.08 |
| **MnO** | 0.00 | 0.05 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| **FeOt** | 0.53 | 4.12 | 0.87 | 0.49 | 0.67 | 0.50 | 0.51 | 0.70 | 0.62 | 0.51 |
| **Total** | 97.67 | 96.09 | 99.27 | 98.91 | 99.63 | 99.69 | 99.58 | 99.34 | 99.62 | 99.82 |

| Date Analysed | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | RVULC41. | S33,10- | S33,10- | S33,10- | S33,10- | S33,10- | S33,10- | S33,10- | S33,10- | S33,10- |
| Na2O | 5.17 | 4.44 | 4.51 | 4.59 | 4.66 | 4.46 | 4.54 | 4.34 | 4.56 | 4.31 |
| MgO | 0.65 | 1.03 | 0.96 | 0.86 | 0.96 | 0.94 | 1.01 | 0.93 | 0.78 | 1.00 |
| Al2O3 | 15.62 | 17.39 | 17.42 | 17.58 | 17.83 | 17.52 | 17.29 | 17.14 | 17.10 | 16.50 |
| SiO2 | 64.69 | 59.93 | 59.53 | 59.75 | 59.16 | 59.14 | 59.09 | 59.22 | 59.41 | 58.08 |
| P2O5 | 0.26 | 0.25 | 0.25 | 0.20 | 0.25 | 0.25 | 0.24 | 0.22 | 0.19 | 0.26 |
| ClO2 | 0.82 | 0.33 | 0.37 | 0.36 | 0.35 | 0.35 | 0.36 | 0.34 | 0.38 | 0.34 |
| K2O | 5.37 | 7.49 | 7.46 | 7.74 | 7.71 | 7.69 | 7.52 | 7.59 | 7.63 | 7.29 |
| CaO | 1.87 | 2.48 | 2.33 | 2.22 | 2.49 | 2.28 | 2.53 | 2.27 | 2.15 | 2.54 |
| TiO2 | 0.65 | 0.57 | 0.57 | 0.56 | 0.57 | 0.53 | 0.51 | 0.55 | 0.46 | 0.54 |
| MnO | 0.14 | 0.07 | 0.16 | 0.09 | 0.13 | 0.11 | 0.11 | 0.14 | 0.16 | 0.09 |
| FeOt | 3.31 | 4.43 | 4.15 | 3.56 | 4.17 | 4.12 | 4.34 | 3.97 | 3.51 | 4.25 |
| Total | 98.55 | 98.40 | 97.71 | 97.50 | 98.27 | 97.38 | 97.54 | 96.74 | 96.31 | 95.19 |
| Date Analysed | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.03.18 | 10.03.18 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S33,10- | S33,10- | S33,10- | S33,10- | S33,10- | S33,10- | S33,10- | S33,10- | S33,90- | S33,90- |
| Na2O | 4.83 | 4.39 | 4.63 | 4.85 | 4.44 | 4.44 | 4.50 | 4.72 | 4.48 | 4.38 |
| MgO | 0.89 | 0.87 | 0.88 | 1.01 | 1.01 | 0.87 | 0.96 | 1.00 | 1.19 | 1.08 |
| Al2O3 | 17.80 | 17.76 | 17.31 | 17.84 | 17.36 | 17.32 | 17.69 | 17.64 | 18.10 | 18.56 |
| SiO2 | 60.11 | 60.03 | 59.56 | 59.68 | 59.21 | 59.81 | 59.74 | 59.24 | 58.81 | 59.58 |
| P2O5 | 0.23 | 0.25 | 0.25 | 0.28 | 0.22 | 0.18 | 0.22 | 0.27 | 0.34 | 0.34 |
| ClO2 | 0.34 | 0.32 | 0.37 | 0.36 | 0.35 | 0.33 | 0.33 | 0.36 | 0.40 | 0.32 |
| K2O | 7.91 | 7.67 | 7.77 | 7.55 | 7.53 | 7.72 | 7.61 | 7.60 | 7.34 | 7.31 |
| CaO | 2.04 | 2.19 | 2.12 | 2.38 | 2.32 | 2.14 | 2.20 | 2.37 | 3.01 | 2.78 |
| TiO2 | 0.56 | 0.57 | 0.58 | 0.59 | 0.56 | 0.46 | 0.61 | 0.58 | 0.46 | 0.53 |
| MnO | 0.13 | 0.07 | 0.12 | 0.17 | 0.07 | 0.12 | 0.10 | 0.14 | 0.18 | 0.24 |
| FeOt | 4.02 | 4.00 | 3.95 | 4.36 | 4.02 | 3.82 | 4.02 | 4.09 | 5.15 | 4.95 |
| Total | 98.85 | 98.15 | 97.54 | 99.08 | 97.09 | 97.20 | 97.98 | 98.01 | 99.46 | 100.06 |
| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- |
| Na2O | 4.58 | 4.55 | 4.71 | 4.62 | 4.67 | 4.68 | 5.24 | 4.96 | 5.20 | 4.71 |
| MgO | 1.16 | 1.23 | 0.92 | 0.91 | 0.78 | 0.98 | 0.86 | 0.86 | 0.94 | 0.92 |
| Al2O3 | 18.33 | 18.14 | 18.59 | 18.66 | 18.23 | 18.09 | 17.86 | 18.25 | 18.05 | 18.43 |
| SiO2 | 59.24 | 58.90 | 60.97 | 59.51 | 61.18 | 60.40 | 59.66 | 60.39 | 59.39 | 60.15 |
| P2O5 | 0.31 | 0.36 | 0.25 | 0.24 | 0.20 | 0.23 | 0.21 | 0.20 | 0.25 | 0.24 |
| ClO2 | 0.32 | 0.38 | 0.36 | 0.33 | 0.35 | 0.34 | 0.35 | 0.38 | 0.37 | 0.39 |
| K2O | 7.61 | 7.43 | 8.03 | 7.89 | 8.05 | 7.85 | 7.94 | 7.75 | 8.03 | 7.94 |
| CaO | 2.79 | 2.87 | 2.27 | 2.19 | 2.22 | 2.39 | 2.20 | 2.08 | 2.06 | 2.24 |
| TiO2 | 0.46 | 0.59 | 0.50 | 0.48 | 0.53 | 0.55 | 0.51 | 0.50 | 0.44 | 0.58 |
| MnO | 0.15 | 0.08 | 0.19 | 0.10 | 0.10 | 0.13 | 0.22 | 0.14 | 0.04 | 0.11 |
| FeOt | 4.86 | 5.13 | 3.92 | 4.11 | 3.57 | 4.08 | 3.88 | 3.82 | 3.75 | 3.67 |
| Total | 99.81 | 99.68 | 100.71 | 99.04 | 99.88 | 99.71 | 98.93 | 99.32 | 98.52 | 99.39 |
| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- |
| Na2O | 4.47 | 5.02 | 4.60 | 5.46 | 4.56 | 5.06 | 4.61 | 4.82 | 4.82 | 4.78 |
| MgO | 1.08 | 1.06 | 1.06 | 0.68 | 0.91 | 0.90 | 0.93 | 0.88 | 0.91 | 0.96 |
| Al2O3 | 18.37 | 17.66 | 17.93 | 17.76 | 18.32 | 18.12 | 18.19 | 18.62 | 18.29 | 18.22 |
| SiO2 | 58.43 | 57.59 | 58.49 | 59.34 | 60.39 | 59.92 | 60.59 | 60.73 | 59.38 | 59.87 |
| P2O5 | 0.30 | 0.28 | 0.35 | 0.17 | 0.24 | 0.24 | 0.22 | 0.25 | 0.26 | 0.28 |
| ClO2 | 0.49 | 0.86 | 0.37 | 0.85 | 0.40 | 0.39 | 0.38 | 0.37 | 0.40 | 0.38 |
| K2O | 7.51 | 7.51 | 7.47 | 8.09 | 8.03 | 7.96 | 8.00 | 8.02 | 7.82 | 7.82 |
| CaO | 2.71 | 2.71 | 2.71 | 1.94 | 2.33 | 2.28 | 2.24 | 2.07 | 2.43 | 2.50 |
| TiO2 | 0.57 | 0.58 | 0.55 | 0.41 | 0.58 | 0.55 | 0.59 | 0.58 | 0.61 | 0.53 |
| MnO | 0.07 | 0.13 | 0.14 | 0.12 | 0.07 | 0.04 | 0.14 | 0.11 | 0.15 | 0.11 |
| FeOt | 4.58 | 4.45 | 4.77 | 3.72 | 4.23 | 3.95 | 4.06 | 4.05 | 4.13 | 4.33 |
| Total | 98.58 | 97.85 | 98.45 | 98.54 | 100.05 | 99.41 | 99.95 | 100.51 | 99.22 | 99.76 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- |
| Na2O | 4.62 | 4.82 | 4.81 | 4.33 | 4.69 | 4.67 | 4.80 | 4.73 | 4.96 | 4.79 |
| MgO | 0.95 | 1.04 | 0.87 | 0.84 | 0.90 | 0.89 | 0.89 | 0.91 | 1.11 | 1.05 |
| Al2O3 | 18.37 | 18.50 | 18.29 | 18.51 | 19.41 | 18.49 | 18.42 | 18.56 | 18.33 | 18.60 |
| SiO2 | 59.82 | 60.07 | 59.87 | 60.37 | 59.96 | 59.93 | 60.93 | 59.93 | 59.36 | 59.70 |
| P2O5 | 0.26 | 0.29 | 0.24 | 0.23 | 0.24 | 0.21 | 0.24 | 0.22 | 0.30 | 0.27 |
| ClO2 | 0.38 | 0.35 | 0.36 | 0.34 | 0.33 | 0.36 | 0.33 | 0.54 | 0.40 | 0.32 |
| K2O | 7.79 | 7.84 | 7.94 | 8.04 | 7.82 | 7.82 | 7.87 | 8.11 | 7.62 | 7.68 |
| CaO | 2.52 | 2.31 | 2.19 | 2.08 | 2.31 | 2.15 | 2.13 | 2.24 | 2.68 | 2.41 |
| TiO2 | 0.54 | 0.61 | 0.57 | 0.57 | 0.54 | 0.60 | 0.56 | 0.54 | 0.53 | 0.59 |
| MnO | 0.09 | 0.10 | 0.16 | 0.09 | 0.00 | 0.16 | 0.12 | 0.15 | 0.09 | 0.14 |
| FeOt | 4.12 | 3.94 | 4.13 | 3.94 | 4.17 | 4.04 | 3.92 | 3.69 | 4.61 | 4.40 |
| Total | 99.46 | 99.87 | 99.44 | 99.34 | 100.38 | 99.32 | 100.20 | 99.60 | 99.99 | 99.96 |
| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- |
| Na2O | 4.76 | 4.84 | 4.70 | 4.38 | 4.95 | 4.71 | 4.15 | 4.50 | 4.61 | 4.86 |
| MgO | 0.96 | 1.03 | 1.05 | 0.91 | 0.87 | 0.88 | 0.88 | 0.90 | 0.92 | 0.86 |
| Al2O3 | 18.19 | 18.00 | 18.25 | 18.15 | 18.27 | 18.22 | 17.77 | 18.61 | 18.52 | 18.48 |
| SiO2 | 59.09 | 59.56 | 59.82 | 60.56 | 60.17 | 60.04 | 58.60 | 61.01 | 60.23 | 60.40 |
| P2O5 | 0.25 | 0.27 | 0.30 | 0.23 | 0.20 | 0.24 | 0.18 | 0.24 | 0.21 | 0.19 |
| ClO2 | 0.37 | 0.38 | 0.36 | 0.33 | 0.30 | 0.36 | 0.30 | 0.37 | 0.41 | 0.35 |
| K2O | 7.76 | 7.72 | 7.68 | 7.91 | 7.83 | 8.00 | 7.28 | 7.91 | 8.03 | 7.80 |
| CaO | 2.70 | 2.57 | 2.52 | 2.23 | 2.15 | 2.11 | 2.25 | 2.12 | 2.31 | 2.18 |
| TiO2 | 0.52 | 0.53 | 0.55 | 0.56 | 0.48 | 0.51 | 0.59 | 0.51 | 0.52 | 0.54 |
| MnO | 0.02 | 0.14 | 0.01 | 0.05 | 0.03 | 0.09 | 0.11 | 0.07 | 0.13 | 0.18 |
| FeOt | 4.33 | 4.27 | 4.56 | 3.69 | 3.84 | 3.81 | 3.73 | 3.55 | 4.10 | 3.86 |
| Total | 98.94 | 99.30 | 99.79 | 99.01 | 99.10 | 98.97 | 95.83 | 99.78 | 99.99 | 99.71 |
| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- | S33,90- |
| Na2O | 4.71 | 4.67 | 4.61 | 4.79 | 4.58 | 4.74 | 4.82 | 4.90 | 4.78 | 4.98 |
| MgO | 0.99 | 0.96 | 1.08 | 1.16 | 1.15 | 0.97 | 0.91 | 0.93 | 0.91 | 0.93 |
| Al2O3 | 18.16 | 18.36 | 18.31 | 18.07 | 18.20 | 18.62 | 18.32 | 18.27 | 18.40 | 18.15 |
| SiO2 | 60.03 | 60.20 | 59.07 | 58.63 | 60.57 | 60.14 | 59.45 | 60.09 | 60.10 | 59.54 |
| P2O5 | 0.21 | 0.22 | 0.32 | 0.32 | 0.31 | 0.22 | 0.25 | 0.27 | 0.22 | 0.25 |
| ClO2 | 0.35 | 0.30 | 0.38 | 0.35 | 0.40 | 0.38 | 0.36 | 0.36 | 0.36 | 0.35 |
| K2O | 7.86 | 7.93 | 7.81 | 7.59 | 7.48 | 7.79 | 7.80 | 7.80 | 8.02 | 7.74 |
| CaO | 2.38 | 2.13 | 2.60 | 2.70 | 2.80 | 2.22 | 2.27 | 2.26 | 2.20 | 2.20 |
| TiO2 | 0.62 | 0.59 | 0.59 | 0.54 | 0.58 | 0.62 | 0.56 | 0.57 | 0.56 | 0.70 |
| MnO | 0.12 | 0.07 | 0.12 | 0.07 | 0.10 | 0.08 | 0.12 | 0.09 | 0.12 | 0.15 |
| FeOt | 3.91 | 4.05 | 4.70 | 4.92 | 4.79 | 3.86 | 4.17 | 3.93 | 3.85 | 3.97 |
| Total | 99.33 | 99.48 | 99.61 | 99.12 | 100.96 | 99.66 | 99.03 | 99.48 | 99.52 | 98.96 |
| Date Analysed | 10.03.18 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S33,90- | S32B.10.1 | S32B.10.2 | S32B.10.3 | S32B.10.4 | S32B.10.5 | S32B.12.1 | S32B.13.1 | S32B.13.2 | S32B.13.3 |
| Na2O | 4.60 | 5.61 | 4.89 | 4.81 | 3.90 | 4.74 | 5.98 | 4.87 | 5.14 | 4.49 |
| MgO | 0.92 | 0.11 | 0.71 | 0.70 | 0.00 | 0.76 | 0.06 | 0.59 | 0.69 | 0.29 |
| Al2O3 | 18.39 | 23.11 | 16.69 | 16.67 | 19.32 | 16.70 | 24.48 | 17.43 | 16.43 | 18.46 |
| SiO2 | 59.63 | 59.41 | 63.75 | 63.21 | 63.31 | 63.31 | 58.37 | 61.65 | 61.98 | 62.31 |
| P2O5 | 0.23 | 0.07 | 0.14 | 0.17 | 0.00 | 0.17 | 0.07 | 0.28 | 0.33 | 0.13 |
| ClO2 | 0.40 | | | | | | | | | |
| K2O | 7.93 | 3.75 | 6.57 | 6.70 | 10.38 | 6.74 | 2.16 | 6.74 | 6.20 | 7.25 |
| CaO | 2.17 | 5.43 | 1.92 | 1.83 | 0.63 | 1.81 | 6.80 | 2.33 | 1.87 | 2.17 |
| TiO2 | 0.69 | 0.13 | 0.39 | 0.42 | 0.03 | 0.43 | 0.05 | 0.47 | 0.55 | 0.35 |
| MnO | 0.02 | 0.00 | 0.11 | 0.13 | 0.00 | 0.07 | 0.03 | 0.11 | 0.16 | 0.03 |
| FeOt | 3.72 | 0.99 | 4.31 | 4.09 | 0.11 | 4.28 | 0.51 | 3.86 | 5.16 | 2.60 |
| Total | 98.71 | 98.60 | 99.48 | 98.73 | 97.69 | 99.02 | 98.50 | 98.35 | 98.49 | 98.06 |

| Date Analysed | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S32B.15.1 | S32B.15.2 | S32B.2.1 | S32B.2.2 | S32B.3.1 | S32B.3.2 | S32B.4.1 | S32B.5.1 | S32B.8.1 | S32B.8.2 |
| Na2O | 5.21 | 6.46 | 4.76 | 5.38 | 4.83 | 4.48 | 4.74 | 4.55 | 4.68 | 4.61 |
| MgO | 0.01 | 0.00 | 0.82 | 0.08 | 0.03 | 0.11 | 0.89 | 0.57 | 0.57 | 0.67 |
| Al2O3 | 20.23 | 23.00 | 16.73 | 26.17 | 19.66 | 18.12 | 17.18 | 16.23 | 15.65 | 16.25 |
| SiO2 | 63.91 | 61.06 | 61.86 | 56.74 | 63.21 | 63.50 | 59.16 | 61.22 | 65.23 | 62.52 |
| P2O5 | 0.02 | 0.07 | 0.21 | 0.04 | 0.09 | 0.09 | 0.31 | 0.25 | 0.13 | 0.26 |
| ClO2 | | | | | | | | | | |
| K2O | 7.63 | 3.29 | 6.92 | 1.57 | 8.19 | 8.82 | 7.27 | 6.23 | 6.63 | 6.53 |
| CaO | 1.65 | 4.89 | 2.20 | 8.53 | 1.76 | 1.15 | 1.92 | 1.98 | 1.48 | 1.93 |
| TiO2 | 0.08 | 0.06 | 0.36 | 0.10 | 0.08 | 0.20 | 0.54 | 0.43 | 0.38 | 0.41 |
| MnO | 0.00 | 0.06 | 0.14 | 0.09 | 0.05 | 0.00 | 0.12 | 0.07 | 0.00 | 0.14 |
| FeOt | 0.32 | 0.32 | 4.03 | 0.84 | 0.49 | 1.06 | 4.88 | 4.24 | 3.88 | 4.48 |
| Total | 99.07 | 99.21 | 98.02 | 99.53 | 98.38 | 97.53 | 97.00 | 95.76 | 98.62 | 97.81 |

| Date Analysed | 10.08.31 | 10.08.31 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S32B.8.3 | S32B.8.4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 |
| Na2O | 4.74 | 4.83 | 3.58 | 3.30 | 2.51 | 3.66 | 3.60 | 3.06 | 3.61 | 3.66 |
| MgO | 0.62 | 0.79 | 0.16 | 0.17 | 0.17 | 0.08 | 0.10 | 0.04 | 0.05 | 0.08 |
| Al2O3 | 16.39 | 15.94 | 13.22 | 13.51 | 13.03 | 12.90 | 13.29 | 12.40 | 12.73 | 13.04 |
| SiO2 | 63.16 | 63.25 | 68.30 | 68.44 | 67.10 | 69.08 | 69.11 | 70.12 | 70.24 | 69.87 |
| P2O5 | 0.19 | 0.17 | 0.06 | 0.07 | 0.20 | 0.00 | 0.00 | 0.01 | 0.01 | 0.04 |
| ClO2 | | | 0.41 | 0.37 | 0.36 | 0.47 | 0.41 | 0.44 | 0.45 | 0.45 |
| K2O | 6.61 | 6.58 | 6.43 | 6.79 | 7.07 | 5.55 | 6.11 | 6.22 | 5.46 | 5.48 |
| CaO | 1.78 | 1.86 | 0.75 | 0.77 | 0.95 | 0.75 | 0.85 | 0.69 | 0.77 | 0.75 |
| TiO2 | 0.40 | 0.39 | 0.19 | 0.16 | 0.20 | 0.09 | 0.16 | 0.09 | 0.15 | 0.13 |
| MnO | 0.02 | 0.16 | 0.04 | 0.09 | 0.07 | 0.14 | 0.14 | 0.10 | 0.04 | 0.00 |
| FeOt | 4.14 | 4.57 | 2.33 | 2.43 | 2.21 | 1.95 | 1.84 | 1.72 | 1.74 | 1.97 |
| Total | 98.05 | 98.54 | 95.46 | 96.11 | 93.87 | 94.66 | 95.60 | 94.90 | 95.25 | 95.48 |

| Date Analysed | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 |
| Na2O | 3.09 | 3.37 | 3.60 | 2.82 | 3.92 | 3.78 | 3.07 | 4.41 | 3.64 | 2.73 |
| MgO | 0.08 | 0.10 | 0.11 | 0.28 | 0.18 | 0.15 | 0.06 | 0.12 | 0.07 | 0.13 |
| Al2O3 | 12.88 | 12.96 | 12.89 | 12.93 | 13.69 | 13.13 | 12.71 | 15.40 | 13.63 | 13.23 |
| SiO2 | 69.84 | 69.35 | 69.86 | 65.31 | 67.16 | 69.19 | 70.35 | 67.92 | 68.72 | 66.79 |
| P2O5 | 0.03 | 0.00 | 0.04 | 0.06 | 0.07 | 0.04 | 0.04 | 0.19 | 0.02 | 0.07 |
| ClO2 | 0.49 | 0.39 | 0.42 | 0.45 | 0.44 | 0.42 | 0.55 | 0.32 | 0.52 | 0.48 |
| K2O | 6.18 | 6.09 | 5.90 | 7.36 | 6.28 | 5.78 | 6.55 | 6.60 | 5.71 | 7.05 |
| CaO | 0.75 | 0.74 | 0.75 | 0.96 | 0.99 | 0.80 | 0.69 | 1.13 | 0.84 | 0.90 |
| TiO2 | 0.12 | 0.10 | 0.15 | 0.21 | 0.18 | 0.13 | 0.12 | 0.26 | 0.18 | 0.17 |
| MnO | 0.02 | 0.08 | 0.01 | 0.03 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 |
| FeOt | 1.66 | 2.01 | 1.95 | 2.61 | 2.41 | 2.10 | 1.78 | 1.94 | 2.18 | 2.16 |
| Total | 95.14 | 95.20 | 95.67 | 93.02 | 95.32 | 95.61 | 95.90 | 98.29 | 95.49 | 93.70 |

| Date Analysed | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | GRVULC4 | S77-tot.0.1 |
| Na2O | 2.68 | 2.77 | 3.28 | 3.58 | 3.85 | 2.09 | 3.43 | 3.08 | 3.89 | 4.57 |
| MgO | 0.15 | 0.15 | 0.16 | 0.08 | 0.06 | 0.05 | 0.11 | 0.12 | 0.10 | 1.80 |
| Al2O3 | 12.91 | 13.28 | 12.62 | 12.96 | 12.87 | 12.84 | 13.29 | 13.07 | 13.53 | 17.65 |
| SiO2 | 67.91 | 68.25 | 69.08 | 69.57 | 68.78 | 69.75 | 67.92 | 68.21 | 68.04 | 55.17 |
| P2O5 | 0.10 | 0.07 | 0.14 | 0.02 | 0.00 | 0.04 | 0.02 | 0.01 | 0.03 | 0.62 |
| ClO2 | 0.39 | 0.39 | 0.39 | 0.42 | 0.45 | 0.42 | 0.52 | 0.49 | 0.50 | 0.32 |
| K2O | 6.80 | 7.11 | 6.60 | 5.78 | 5.53 | 7.25 | 6.22 | 6.46 | 5.83 | 6.61 |
| CaO | 0.82 | 0.87 | 0.83 | 0.72 | 0.78 | 0.77 | 0.81 | 0.88 | 0.87 | 4.09 |
| TiO2 | 0.10 | 0.18 | 0.19 | 0.14 | 0.14 | 0.11 | 0.18 | 0.15 | 0.19 | 0.64 |
| MnO | 0.04 | 0.13 | 0.05 | 0.06 | 0.06 | 0.11 | 0.12 | 0.10 | 0.17 | 0.14 |
| FeOt | 1.89 | 2.26 | 2.24 | 1.69 | 1.71 | 1.74 | 2.48 | 2.08 | 2.30 | 6.39 |
| Total | 93.79 | 95.45 | 95.58 | 95.03 | 94.24 | 95.17 | 95.10 | 94.65 | 95.42 | 98.00 |

| Date Analysed | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-tot.0.2 | S77-tot.1.1 | S77-tot.1.3 | S77-tot.1.4 | S77- | S77-tot.3.1 | S77-tot.3.2 | S77-tot.4.1 | S77-tot.5.1 | S77-tot.6.1 |
| Na2O | 4.49 | 4.82 | 4.64 | 4.93 | 4.44 | 4.98 | 6.06 | 5.09 | 4.51 | 4.80 |
| MgO | 1.90 | 1.98 | 2.07 | 2.05 | 1.56 | 2.28 | 2.16 | 1.66 | 1.78 | 1.66 |
| Al2O3 | 18.29 | 17.98 | 17.60 | 17.79 | 16.85 | 18.04 | 16.99 | 17.77 | 17.81 | 17.38 |
| SiO2 | 55.71 | 55.15 | 54.50 | 54.87 | 54.52 | 55.85 | 54.17 | 55.90 | 55.31 | 55.11 |
| P2O5 | 0.58 | 0.58 | 0.57 | 0.56 | 0.49 | 0.62 | 0.56 | 0.59 | 0.59 | 0.55 |
| ClO2 | 0.31 | 0.28 | 0.30 | 0.33 | 0.31 | 0.08 | 0.30 | 0.26 | 0.34 | 0.30 |
| K2O | 6.68 | 6.95 | 6.65 | 6.58 | 6.74 | 3.64 | 5.73 | 6.70 | 6.94 | 6.83 |
| CaO | 4.14 | 4.30 | 4.57 | 4.61 | 3.65 | 6.32 | 4.48 | 3.82 | 3.98 | 3.80 |
| TiO2 | 0.62 | 0.64 | 0.63 | 0.63 | 0.58 | 0.66 | 0.61 | 0.59 | 0.63 | 0.57 |
| MnO | 0.14 | 0.17 | 0.11 | 0.13 | 0.12 | 0.25 | 0.09 | 0.13 | 0.15 | 0.20 |
| FeOt | 6.31 | 6.59 | 6.77 | 6.90 | 5.94 | 7.17 | 6.86 | 6.15 | 6.52 | 6.31 |
| Total | 99.17 | 99.44 | 98.42 | 99.39 | 95.19 | 99.90 | 97.99 | 98.66 | 98.55 | 97.50 |

| Date Analysed | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-tot.6.2 | S77-tot.6.3 | S77-tot.6.4 | S77-tot.6.5 | S77-tot.7.2 | S77-tot.7.3 | S77-tot.8.1 | S77-e.1.1 | S77-e.1.2 | S77- |
| Na2O | 4.42 | 4.33 | 4.39 | 4.35 | 4.48 | 4.57 | 4.89 | 2.44 | 4.68 | 4.44 |
| MgO | 1.66 | 1.63 | 1.75 | 1.74 | 2.36 | 2.42 | 1.67 | 1.90 | 1.67 | 1.63 |
| Al2O3 | 17.24 | 17.44 | 17.48 | 17.83 | 16.86 | 17.23 | 17.44 | 18.48 | 17.70 | 18.23 |
| SiO2 | 54.71 | 54.36 | 55.25 | 55.65 | 52.51 | 53.29 | 55.46 | 56.20 | 55.60 | 57.31 |
| P2O5 | 0.51 | 0.53 | 0.55 | 0.52 | 0.53 | 0.56 | 0.55 | 0.27 | 0.57 | 0.60 |
| ClO2 | 0.30 | 0.29 | 0.32 | 0.31 | 0.34 | 0.32 | 0.30 | 0.14 | 0.30 | 0.27 |
| K2O | 6.82 | 6.72 | 7.17 | 6.98 | 6.27 | 6.28 | 6.72 | 12.07 | 7.00 | 6.96 |
| CaO | 3.77 | 3.71 | 3.81 | 3.85 | 4.91 | 5.19 | 3.97 | 3.84 | 3.80 | 3.92 |
| TiO2 | 0.59 | 0.69 | 0.60 | 0.63 | 0.65 | 0.66 | 0.64 | 0.32 | 0.62 | 0.55 |
| MnO | 0.21 | 0.21 | 0.25 | 0.08 | 0.16 | 0.14 | 0.22 | 0.14 | 0.11 | 0.16 |
| FeOt | 6.35 | 5.84 | 6.30 | 6.26 | 6.91 | 6.96 | 6.52 | 3.71 | 5.93 | 6.19 |
| Total | 96.57 | 95.75 | 97.87 | 98.22 | 95.97 | 97.61 | 98.38 | 99.50 | 97.98 | 100.25 |

| Date Analysed | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77- | S77- | S77-e.2.1 | S77-e.3.1 | S77-e.3.2 | S77-e.3.3 | S77-e.4.1 | S77-e.7.3 | S77-e.8.1 | S77-e.8.2 |
| Na2O | 4.66 | 4.12 | 3.71 | 4.09 | 4.87 | 4.28 | 4.60 | 4.53 | 4.51 | 4.55 |
| MgO | 1.72 | 1.62 | 1.93 | 1.81 | 1.64 | 2.11 | 1.70 | 1.74 | 1.76 | 1.80 |
| Al2O3 | 17.26 | 17.27 | 17.31 | 17.55 | 16.99 | 18.24 | 16.61 | 17.40 | 17.11 | 17.73 |
| SiO2 | 54.19 | 55.45 | 53.60 | 56.01 | 55.12 | 55.55 | 55.51 | 55.14 | 53.24 | 55.47 |
| P2O5 | 0.54 | 0.55 | 0.55 | 0.60 | 0.56 | 0.53 | 0.56 | 0.55 | 0.45 | 0.58 |
| ClO2 | 0.34 | 0.27 | 0.30 | 0.31 | 0.31 | 0.34 | 0.29 | 0.30 | 0.38 | 0.35 |
| K2O | 6.63 | 6.67 | 7.15 | 8.17 | 6.95 | 6.53 | 6.89 | 6.79 | 6.86 | 6.89 |
| CaO | 3.81 | 3.88 | 4.48 | 1.15 | 3.55 | 4.38 | 3.70 | 3.96 | 3.95 | 3.98 |
| TiO2 | 0.64 | 0.58 | 0.59 | 0.64 | 0.57 | 0.67 | 0.58 | 0.61 | 0.67 | 0.70 |
| MnO | 0.22 | 0.19 | 0.15 | 0.10 | 0.13 | 0.14 | 0.12 | 0.09 | 0.12 | 0.12 |
| FeOt | 6.27 | 6.53 | 6.41 | 6.29 | 6.35 | 6.10 | 6.30 | 6.53 | 6.25 | 6.48 |
| Total | 96.29 | 97.11 | 96.18 | 96.73 | 97.04 | 98.87 | 96.86 | 97.64 | 95.28 | 98.65 |

| Date Analysed | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-b.1.1 | S77- | S77- | S77- | S77- | S77-b.3.2 | S77-b.3.3 | S77-b.9.1 |
| Na2O | 4.41 | 4.45 | 4.38 | 4.87 | 4.38 | 4.19 | 4.48 | 4.46 |
| MgO | 1.97 | 1.68 | 1.65 | 1.70 | 1.70 | 1.52 | 1.70 | 1.55 |
| Al2O3 | 17.98 | 17.95 | 17.01 | 18.57 | 17.80 | 18.17 | 17.69 | 17.64 |
| SiO2 | 54.68 | 53.73 | 54.26 | 54.13 | 56.15 | 56.72 | 55.91 | 55.79 |
| P2O5 | 0.58 | 0.61 | 0.53 | 0.58 | 0.57 | 0.53 | 0.60 | 0.59 |
| ClO2 | 0.28 | 0.36 | 0.30 | 0.33 | 0.36 | 0.34 | 0.28 | 0.32 |
| K2O | 6.77 | 6.87 | 6.75 | 6.80 | 6.87 | 7.15 | 6.76 | 6.93 |
| CaO | 4.47 | 4.01 | 3.67 | 3.97 | 3.78 | 3.89 | 3.90 | 3.99 |
| TiO2 | 0.63 | 0.62 | 0.59 | 0.66 | 0.61 | 0.62 | 0.59 | 0.61 |
| MnO | 0.14 | 0.12 | 0.09 | 0.16 | 0.15 | 0.18 | 0.04 | 0.15 |
| FeOt | 6.50 | 6.07 | 6.15 | 6.15 | 6.55 | 6.24 | 6.13 | 6.16 |
| Total | 98.41 | 96.46 | 95.37 | 97.92 | 98.93 | 99.56 | 98.08 | 98.20 |

Table D1: Complete list of data produced through EMPA at Oxford for glass samples collected from La Fossa

| Date Analysed | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 |
| Label | GAT2.1.1 | GAT2.1.2 | GAT2.1.3 | GAT2.10.1 | GAT2.10.2 | GAT2.10.3 | GAT2.11.1 | GAT2.11.2 | GAT2.11.3 | GAT2.12.1 |
| Na2O | 4.64 | 4.49 | 4.71 | 4.77 | 4.67 | 4.62 | 4.65 | 4.58 | 4.65 | 4.51 |
| MgO | 0.97 | 1.02 | 1.00 | 1.05 | 1.07 | 0.99 | 0.92 | 0.91 | 0.98 | 1.01 |
| Al2O3 | 17.28 | 17.22 | 17.20 | 17.09 | 17.01 | 16.98 | 17.18 | 16.38 | 17.10 | 17.13 |
| SiO2 | 61.71 | 60.94 | 61.01 | 60.67 | 60.93 | 61.10 | 61.09 | 60.01 | 61.12 | 60.93 |
| P2O5 | 0.31 | 0.33 | 0.33 | 0.34 | 0.36 | 0.34 | 0.28 | 0.93 | 0.33 | 0.33 |
| ClO2 | 0.27 | 0.29 | 0.29 | 0.40 | 0.37 | 0.33 | 0.33 | 0.32 | 0.36 | 0.38 |
| K2O | 7.09 | 6.93 | 7.07 | 6.94 | 7.00 | 7.02 | 6.87 | 7.05 | 6.89 | 7.16 |
| CaO | 2.60 | 2.56 | 2.57 | 2.49 | 2.60 | 2.36 | 2.51 | 3.01 | 2.40 | 2.58 |
| TiO2 | 0.46 | 0.52 | 0.44 | 0.51 | 0.48 | 0.49 | 0.53 | 0.48 | 0.48 | 0.54 |
| MnO | 0.10 | 0.08 | 0.12 | 0.17 | 0.14 | 0.10 | 0.11 | 0.11 | 0.00 | 0.03 |
| FeOt | 4.97 | 4.82 | 5.29 | 5.36 | 5.49 | 5.29 | 5.39 | 4.87 | 4.67 | 5.58 |
| Total | 100.41 | 99.22 | 100.02 | 99.80 | 100.11 | 99.63 | 99.87 | 98.66 | 98.96 | 100.17 |

| Date Analysed | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 |
| Label | GAT2.12.2 | GAT2.12.3 | GAT2.13.1 | GAT2.13.2 | GAT2.13.3 | GAT2.14.1 | GAT2.14.2 | GAT2.14.3 | GAT2.15.1 | GAT2.15.2 |
| Na2O | 4.57 | 4.49 | 4.42 | 4.47 | 4.51 | 4.70 | 4.88 | 4.75 | 4.55 | 4.43 |
| MgO | 1.05 | 1.07 | 0.94 | 0.92 | 1.14 | 1.01 | 0.98 | 1.01 | 1.00 | 0.87 |
| Al2O3 | 17.06 | 17.16 | 17.40 | 17.02 | 17.00 | 17.10 | 17.22 | 17.13 | 17.19 | 17.71 |
| SiO2 | 61.11 | 60.83 | 61.37 | 59.81 | 60.53 | 61.02 | 60.88 | 60.86 | 61.07 | 61.20 |
| P2O5 | 0.30 | 0.34 | 0.31 | 0.29 | 0.33 | 0.29 | 0.33 | 0.31 | 0.33 | 0.30 |
| ClO2 | 0.39 | 0.38 | 0.28 | 0.28 | 0.35 | 0.30 | 0.31 | 0.31 | 0.37 | 0.34 |
| K2O | 7.05 | 6.97 | 7.46 | 7.28 | 7.01 | 6.87 | 7.00 | 6.91 | 6.98 | 7.06 |
| CaO | 2.49 | 2.51 | 2.46 | 2.52 | 2.73 | 2.60 | 2.36 | 2.53 | 2.42 | 2.52 |
| TiO2 | 0.55 | 0.55 | 0.48 | 0.47 | 0.56 | 0.51 | 0.53 | 0.61 | 0.53 | 0.48 |
| MnO | 0.14 | 0.09 | 0.08 | 0.16 | 0.10 | 0.11 | 0.12 | 0.07 | 0.06 | 0.10 |
| FeOt | 5.54 | 5.49 | 4.84 | 4.77 | 5.15 | 5.13 | 5.19 | 5.40 | 5.20 | 4.38 |
| Total | 100.24 | 99.88 | 100.04 | 97.99 | 99.41 | 99.63 | 99.79 | 99.88 | 99.71 | 99.39 |

| Date Analysed | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 |
| Label | GAT2.15.3 | GAT2.2.1 | GAT2.2.2 | GAT2.2.3 | GAT2.3.1 | GAT2.3a.1 | GAT2.3a.2 | GAT2.4.1 | GAT2.4.2 | GAT2.4.3 |
| Na2O | 4.92 | 5.21 | 4.98 | 5.22 | 4.32 | 4.64 | 4.75 | 4.79 | 4.67 | 4.34 |
| MgO | 1.01 | 0.31 | 0.22 | 0.31 | 1.02 | 0.98 | 1.03 | 0.94 | 1.00 | 0.82 |
| Al2O3 | 17.39 | 17.30 | 17.50 | 20.17 | 16.59 | 17.19 | 17.02 | 17.38 | 17.24 | 17.40 |
| SiO2 | 61.16 | 66.20 | 65.44 | 63.17 | 59.72 | 60.89 | 60.74 | 61.62 | 61.29 | 60.18 |
| P2O5 | 0.30 | 0.32 | 0.32 | 0.33 | 0.41 | 0.27 | 0.30 | 0.29 | 0.32 | 0.27 |
| ClO2 | 0.37 | 0.31 | 0.30 | 0.25 | 0.08 | 0.37 | 0.38 | 0.33 | 0.30 | 0.29 |
| K2O | 7.11 | 6.51 | 7.56 | 5.81 | 6.35 | 6.92 | 6.95 | 6.96 | 7.06 | 7.06 |
| CaO | 2.47 | 1.43 | 0.81 | 2.06 | 3.24 | 2.45 | 2.60 | 2.40 | 2.35 | 2.66 |
| TiO2 | 0.49 | 0.74 | 0.47 | 0.49 | 0.46 | 0.50 | 0.52 | 0.55 | 0.53 | 0.52 |
| MnO | 0.03 | 0.01 | 0.00 | 0.14 | 0.11 | 0.10 | 0.18 | 0.09 | 0.13 | 0.04 |
| FeOt | 5.04 | 2.05 | 1.79 | 1.52 | 5.04 | 5.35 | 5.11 | 5.46 | 5.45 | 4.70 |
| Total | 100.28 | 100.39 | 99.41 | 99.49 | 97.32 | 99.65 | 99.59 | 100.81 | 100.33 | 98.29 |

| Date Analysed | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 |
| Label | GAT2.5.1 | GAT2.5.2 | GAT2.5.3 | GAT2.6.1 | GAT2.6.2 | GAT2.6.3 | GAT2.7.1 | GAT2.7.2 | GAT2.7.3 | GAT2.8.1 |
| Na2O | 4.25 | 4.53 | 4.53 | 4.56 | 4.89 | 4.62 | 4.68 | 4.68 | 4.63 | 4.72 |
| MgO | 0.96 | 1.00 | 1.04 | 0.67 | 1.01 | 1.02 | 1.05 | 1.02 | 0.92 | 1.05 |
| Al2O3 | 17.02 | 17.05 | 16.98 | 18.45 | 16.99 | 17.22 | 16.99 | 17.26 | 17.41 | 17.46 |
| SiO2 | 59.18 | 60.90 | 60.69 | 59.83 | 60.92 | 61.04 | 60.96 | 61.26 | 60.62 | 61.29 |
| P2O5 | 0.22 | 0.28 | 0.31 | 0.26 | 0.35 | 0.28 | 0.32 | 0.32 | 0.30 | 0.34 |
| ClO2 | 0.38 | 0.39 | 0.40 | 0.25 | 0.33 | 0.31 | 0.42 | 0.34 | 0.34 | 0.31 |
| K2O | 7.04 | 7.01 | 7.07 | 6.70 | 7.06 | 7.11 | 6.91 | 7.03 | 7.10 | 6.86 |
| CaO | 2.46 | 2.64 | 2.48 | 2.98 | 2.35 | 2.53 | 2.47 | 2.60 | 2.37 | 2.63 |
| TiO2 | 0.56 | 0.54 | 0.55 | 0.35 | 0.51 | 0.52 | 0.60 | 0.60 | 0.48 | 0.54 |
| MnO | 0.14 | 0.11 | 0.21 | 0.00 | 0.13 | 0.18 | 0.17 | 0.17 | 0.15 | 0.08 |
| FeOt | 5.46 | 4.98 | 5.29 | 3.73 | 5.21 | 5.26 | 5.37 | 5.40 | 5.06 | 5.18 |
| Total | 97.67 | 99.45 | 99.55 | 97.77 | 99.75 | 100.09 | 99.94 | 100.67 | 99.38 | 100.45 |

| Date Analysed | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 |
| **Label** | GAT2.8.2 | GAT2.8.3 | GAT2.9.1 | GAT2.9.2 | GAT2.9.3 | AT12.1.1 | AT12.1.2 | AT12.10.1 | AT12.19.1 | AT12.2.1 |
| **Na2O** | 4.76 | 4.77 | 4.28 | 4.80 | 4.87 | 5.79 | 5.06 | 5.23 | 4.35 | 4.73 |
| **MgO** | 1.07 | 1.05 | 0.96 | 1.05 | 1.00 | 0.03 | 0.05 | 0.28 | 0.06 | 0.04 |
| **Al2O3** | 17.29 | 17.02 | 16.91 | 16.97 | 17.23 | 25.02 | 18.96 | 21.85 | 27.73 | 20.60 |
| **SiO2** | 60.71 | 61.01 | 60.88 | 60.75 | 61.15 | 58.38 | 63.44 | 59.53 | 54.85 | 62.22 |
| **P2O5** | 0.32 | 0.29 | 0.30 | 0.32 | 0.28 | 0.03 | 0.15 | 0.33 | 0.08 | 0.08 |
| **ClO2** | 0.36 | 0.36 | 0.35 | 0.37 | 0.42 | 0.02 | 0.10 | 0.03 | 0.02 | 0.02 |
| **K2O** | 6.97 | 7.09 | 7.32 | 6.75 | 6.92 | 1.84 | 6.71 | 3.85 | 1.12 | 6.25 |
| **CaO** | 2.65 | 2.43 | 2.61 | 2.58 | 2.52 | 7.42 | 2.09 | 6.18 | 9.94 | 3.28 |
| **TiO2** | 0.57 | 0.49 | 0.53 | 0.53 | 0.46 | 0.02 | 0.16 | 0.12 | 0.00 | 0.08 |
| **MnO** | 0.07 | 0.06 | 0.03 | 0.11 | 0.14 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 |
| **FeOt** | 5.31 | 5.18 | 5.01 | 5.20 | 4.83 | 0.55 | 1.08 | 1.72 | 0.78 | 0.58 |
| **Total** | 100.07 | 99.74 | 99.19 | 99.43 | 99.82 | 99.10 | 97.79 | 99.11 | 98.99 | 97.87 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Vulcanello 3 | Pietre Cotte |
| **Label** | AT12.4.1 | AT12.7.1 | AT12.9.1 | VLS3.1.1 | VLS3.1.3 | VLS3.13.1 | VLS3.3.1 | VLS3.4.1 | VLS3.5.1 | VlocTr2.1.1 |
| **Na2O** | 5.00 | 5.65 | 5.01 | 5.02 | 4.97 | 5.07 | 4.82 | 4.92 | 5.16 | 4.65 |
| **MgO** | 0.10 | 0.06 | 0.01 | 1.81 | 1.77 | 1.82 | 1.77 | 1.87 | 1.84 | 0.85 |
| **Al2O3** | 18.36 | 25.66 | 21.29 | 17.46 | 17.27 | 17.54 | 17.07 | 17.57 | 17.21 | 19.86 |
| **SiO2** | 62.43 | 57.48 | 61.68 | 55.02 | 54.25 | 54.74 | 54.33 | 54.55 | 54.62 | 59.04 |
| **P2O5** | 0.18 | 0.05 | 0.22 | 0.74 | 0.69 | 0.65 | 0.62 | 0.68 | 0.68 | 0.30 |
| **ClO2** | 0.17 | 0.00 | 0.02 | | | | | | | |
| **K2O** | 6.27 | 1.55 | 6.45 | 6.02 | 6.34 | 6.65 | 6.58 | 6.52 | 6.53 | 5.76 |
| **CaO** | 2.80 | 8.66 | 3.49 | 4.39 | 4.04 | 4.13 | 4.11 | 4.13 | 4.14 | 4.40 |
| **TiO2** | 0.45 | 0.06 | 0.16 | 0.69 | 0.69 | 0.67 | 0.67 | 0.65 | 0.68 | 0.42 |
| **MnO** | 0.00 | 0.00 | 0.04 | 0.12 | 0.23 | 0.17 | 0.15 | 0.13 | 0.17 | 0.02 |
| **FeOt** | 2.38 | 0.66 | 0.98 | 7.28 | 6.97 | 6.57 | 6.77 | 6.96 | 6.89 | 3.16 |
| **Total** | 98.15 | 99.83 | 99.35 | 98.56 | 97.23 | 98.02 | 96.88 | 97.98 | 97.93 | 98.46 |

| Date Analysed | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | VlocTr2.13.1 | VlocTr2.4.1 | VlocTr2.4.2 | VlocTr2.4.3 | VlocTr2.5.1 | VlocTr2.5.2 | VlocTr2.5.3 | VlocTr2.8.1 | VlocTr2.8.2 | VloTr2d.13.1 |
| **Na2O** | 4.69 | 4.51 | 4.12 | 5.57 | 4.36 | 4.30 | 4.91 | 4.72 | 4.97 | 4.93 |
| **MgO** | 1.20 | 0.20 | 0.38 | 0.19 | 0.18 | 0.23 | 0.23 | 1.16 | 1.23 | 0.95 |
| **Al2O3** | 17.15 | 14.54 | 13.52 | 17.04 | 14.39 | 13.62 | 14.84 | 17.29 | 16.78 | 17.36 |
| **SiO2** | 58.45 | 68.43 | 69.11 | 64.92 | 67.38 | 67.29 | 67.52 | 58.22 | 57.87 | 58.97 |
| **P2O5** | 0.37 | 0.07 | 0.06 | 0.06 | 0.07 | 0.12 | 0.07 | 0.37 | 0.32 | 0.31 |
| **ClO2** | | | | | | | | | | |
| **K2O** | 6.78 | 6.36 | 6.12 | 5.63 | 6.82 | 6.17 | 5.83 | 7.42 | 6.28 | 7.23 |
| **CaO** | 2.99 | 1.07 | 0.96 | 1.66 | 0.86 | 0.94 | 0.99 | 2.23 | 3.09 | 2.50 |
| **TiO2** | 0.63 | 0.27 | 0.34 | 0.20 | 0.28 | 0.26 | 0.20 | 0.58 | 0.59 | 0.60 |
| **MnO** | 0.18 | 0.04 | 0.18 | 0.12 | 0.08 | 0.18 | 0.10 | 0.16 | 0.15 | 0.15 |
| **FeOt** | 5.39 | 3.00 | 3.86 | 2.01 | 2.76 | 3.30 | 2.82 | 5.18 | 5.27 | 5.00 |
| **Total** | 97.82 | 98.49 | 98.64 | 97.39 | 97.17 | 96.39 | 97.52 | 97.32 | 96.56 | 98.01 |

| Date Analysed | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | VloTr2d.13.3 | VloTr2d.13.4 | VloTr2d.4.1 | VloTr2d.4.2 | VloTr2d.4.3 | VloTr2d.4.4 | VloTr2d.7.1 | VloTr2d.7.2 | VloTr2d.7.3 | VloTr2d.7.4 |
| **Na2O** | 4.20 | 4.24 | 3.79 | 4.35 | 4.50 | 3.43 | 4.64 | 4.59 | 4.63 | 4.90 |
| **MgO** | 0.50 | 0.36 | 0.65 | 0.96 | 1.32 | 2.45 | 1.28 | 1.27 | 1.34 | 1.36 |
| **Al2O3** | 18.85 | 20.81 | 18.90 | 18.34 | 17.90 | 16.81 | 17.51 | 17.42 | 17.42 | 17.52 |
| **SiO2** | 60.65 | 59.53 | 58.20 | 58.40 | 58.25 | 55.23 | 58.30 | 58.29 | 58.76 | 58.23 |
| **P2O5** | 0.23 | 0.16 | 0.29 | 0.35 | 0.37 | 0.31 | 0.42 | 0.39 | 0.48 | 0.41 |
| **ClO2** | | | | | | | | | | |
| **K2O** | 8.27 | 6.88 | 7.83 | 6.94 | 6.92 | 6.71 | 7.02 | 7.45 | 7.12 | 7.29 |
| **CaO** | 2.31 | 3.83 | 2.82 | 3.37 | 2.85 | 5.05 | 2.91 | 2.71 | 3.11 | 2.71 |
| **TiO2** | 0.34 | 0.25 | 0.39 | 0.59 | 0.62 | 0.59 | 0.60 | 0.59 | 0.53 | 0.57 |
| **MnO** | 0.03 | 0.08 | 0.12 | 0.11 | 0.22 | 0.12 | 0.11 | 0.14 | 0.10 | 0.19 |
| **FeOt** | 3.13 | 2.20 | 3.61 | 4.60 | 5.37 | 5.62 | 5.90 | 5.51 | 5.59 | 5.79 |
| **Total** | 98.50 | 98.33 | 96.60 | 98.01 | 98.32 | 96.32 | 98.68 | 98.36 | 99.06 | 98.96 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.31 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Pietre Cotte | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato |
| **Label** | VloTr2d.7.5 | S86.1.1 | S86.1.2 | S86.1.3 | S86.1.4 | S86.1.5 | S86.1.6 | S86.10.1 | S86.10.2 | S86.10.3 |
| **Na2O** | 4.81 | 4.04 | 4.25 | 4.21 | 4.07 | 3.77 | 4.10 | 3.94 | 3.45 | 3.77 |
| **MgO** | 1.31 | 0.06 | 0.01 | 0.03 | 0.03 | 0.03 | 0.05 | 0.00 | 0.03 | 0.04 |
| **Al2O3** | 17.44 | 13.05 | 13.00 | 13.18 | 12.85 | 13.02 | 13.14 | 13.00 | 12.53 | 13.27 |
| **SiO2** | 58.66 | 75.28 | 74.57 | 74.55 | 74.41 | 73.58 | 75.02 | 72.06 | 72.02 | 74.32 |
| **P2O5** | 0.44 | 0.00 | 0.00 | 0.00 | 0.03 | 0.01 | 0.04 | 0.03 | 0.02 | 0.01 |
| **ClO2** | | 0.37 | 0.37 | 0.37 | 0.32 | 0.35 | 0.41 | 0.31 | 0.37 | 0.36 |
| **K2O** | 6.94 | 5.07 | 4.99 | 5.10 | 4.96 | 5.10 | 5.01 | 5.56 | 4.89 | 5.08 |
| **CaO** | 3.02 | 0.78 | 0.74 | 0.79 | 0.65 | 0.67 | 0.66 | 0.61 | 0.67 | 0.76 |
| **TiO2** | 0.60 | 0.10 | 0.08 | 0.11 | 0.08 | 0.05 | 0.10 | 0.06 | 0.10 | 0.11 |
| **MnO** | 0.07 | 0.03 | 0.05 | 0.06 | 0.01 | 0.00 | 0.15 | 0.00 | 0.02 | 0.07 |
| **FeOt** | 5.60 | 1.67 | 1.50 | 1.64 | 1.69 | 1.47 | 1.62 | 1.12 | 1.58 | 1.36 |
| **Total** | 98.87 | 100.46 | 99.55 | 100.04 | 99.10 | 98.06 | 100.32 | 96.68 | 95.70 | 99.16 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato |
| **Label** | S86.10.4 | S86.10.5 | S86.10.6 | S86.2.1 | S86.2.2 | S86.2.3 | S86.2.4 | S86.2.5 | S86.2.6 | S86.3.1 |
| **Na2O** | 3.90 | 4.21 | 3.93 | 3.80 | 3.88 | 3.85 | 3.68 | 3.85 | 3.99 | 4.09 |
| **MgO** | 0.04 | 0.04 | 0.06 | 0.04 | 0.05 | 0.04 | 0.03 | 0.03 | 0.04 | 0.01 |
| **Al2O3** | 12.93 | 12.97 | 12.74 | 13.04 | 12.25 | 12.56 | 12.95 | 12.52 | 13.06 | 13.08 |
| **SiO2** | 74.58 | 74.83 | 72.65 | 74.92 | 70.88 | 71.16 | 72.69 | 71.38 | 73.80 | 74.91 |
| **P2O5** | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.02 | 0.00 |
| **ClO2** | 0.32 | 0.32 | 0.39 | 0.35 | 0.39 | 0.37 | 0.39 | 0.42 | 0.40 | 0.36 |
| **K2O** | 5.02 | 5.19 | 4.84 | 4.97 | 4.84 | 4.82 | 4.92 | 4.94 | 4.93 | 5.12 |
| **CaO** | 0.74 | 0.74 | 0.71 | 0.73 | 0.64 | 0.74 | 0.79 | 0.68 | 0.75 | 0.65 |
| **TiO2** | 0.13 | 0.10 | 0.09 | 0.09 | 0.08 | 0.08 | 0.03 | 0.04 | 0.08 | 0.03 |
| **MnO** | 0.07 | 0.09 | 0.06 | 0.02 | 0.10 | 0.03 | 0.12 | 0.10 | 0.14 | 0.14 |
| **FeOt** | 1.62 | 1.50 | 1.41 | 1.51 | 3.51 | 1.50 | 1.40 | 1.63 | 1.66 | 1.51 |
| **Total** | 99.36 | 99.99 | 96.87 | 99.47 | 96.62 | 95.15 | 97.05 | 95.60 | 98.86 | 99.90 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato |
| **Label** | S86.3.2 | S86.3.3 | S86.3.4 | S86.3.5 | S86.3.6 | S86.4.1 | S86.4.2 | S86.4.3 | S86.4.4 | S86.4.5 |
| **Na2O** | 3.89 | 3.79 | 3.97 | 4.12 | 3.79 | 3.83 | 3.82 | 4.13 | 4.00 | 4.02 |
| **MgO** | 0.03 | 0.03 | 0.03 | 0.04 | 0.06 | 0.04 | 0.01 | 0.04 | 0.05 | 0.03 |
| **Al2O3** | 12.59 | 12.68 | 12.88 | 12.33 | 12.66 | 13.16 | 12.55 | 13.27 | 12.60 | 12.92 |
| **SiO2** | 74.15 | 73.87 | 72.25 | 72.85 | 72.83 | 74.79 | 70.82 | 73.96 | 72.69 | 74.43 |
| **P2O5** | 0.01 | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | 0.01 | 0.02 | 0.08 | 0.00 |
| **ClO2** | 0.37 | 0.38 | 0.43 | 0.41 | 0.36 | 0.36 | 0.38 | 0.36 | 0.33 | 0.38 |
| **K2O** | 5.04 | 4.90 | 4.90 | 4.82 | 4.92 | 5.02 | 4.81 | 5.07 | 4.99 | 5.02 |
| **CaO** | 0.77 | 0.76 | 0.79 | 0.72 | 0.75 | 0.76 | 0.78 | 0.80 | 0.82 | 0.73 |
| **TiO2** | 0.13 | 0.07 | 0.09 | 0.07 | 0.07 | 0.04 | 0.05 | 0.09 | 0.02 | 0.08 |
| **MnO** | 0.03 | 0.03 | 0.12 | 0.08 | 0.08 | 0.09 | 0.01 | 0.02 | 0.09 | 0.12 |
| **FeOt** | 1.65 | 1.56 | 1.68 | 1.57 | 1.33 | 1.62 | 1.45 | 1.67 | 1.50 | 1.59 |
| **Total** | 98.66 | 98.07 | 97.13 | 97.02 | 96.90 | 99.73 | 94.70 | 99.42 | 97.18 | 99.32 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato |
| **Label** | S86.4.6 | S86.5.1 | S86.5.2 | S86.5.3 | S86.5.4 | S86.5.5 | S86.5.6 | S86.6.1 | S86.6.2 | S86.6.3 |
| **Na2O** | 4.03 | 4.04 | 4.03 | 3.91 | 3.95 | 3.97 | 4.00 | 4.00 | 4.01 | 4.00 |
| **MgO** | 0.04 | 0.04 | 0.05 | 0.03 | 0.03 | 0.03 | 0.05 | 0.01 | 0.04 | 0.03 |
| **Al2O3** | 13.05 | 13.17 | 13.26 | 12.86 | 12.88 | 13.04 | 13.19 | 12.92 | 13.13 | 13.37 |
| **SiO2** | 75.22 | 74.20 | 74.01 | 74.65 | 74.48 | 74.87 | 74.83 | 74.41 | 74.46 | 74.83 |
| **P2O5** | 0.00 | 0.00 | 0.02 | 0.03 | 0.04 | 0.01 | 0.05 | 0.00 | 0.04 | 0.03 |
| **ClO2** | 0.37 | 0.33 | 0.37 | 0.36 | 0.32 | 0.40 | 0.37 | 0.37 | 0.34 | 0.36 |
| **K2O** | 5.07 | 5.10 | 5.26 | 4.99 | 4.96 | 4.99 | 5.22 | 5.13 | 5.15 | 5.03 |
| **CaO** | 0.81 | 0.72 | 0.73 | 0.80 | 0.73 | 0.73 | 0.70 | 0.73 | 0.78 | 0.71 |
| **TiO2** | 0.07 | 0.08 | 0.08 | 0.07 | 0.08 | 0.06 | 0.09 | 0.06 | 0.06 | 0.09 |
| **MnO** | 0.05 | 0.08 | 0.06 | 0.10 | 0.04 | 0.00 | 0.05 | 0.06 | 0.04 | 0.08 |
| **FeOt** | 1.56 | 1.44 | 1.59 | 1.37 | 1.51 | 1.64 | 1.48 | 1.61 | 1.65 | 1.73 |
| **Total** | 100.27 | 99.20 | 99.47 | 99.17 | 99.01 | 99.76 | 100.01 | 99.29 | 99.69 | 100.25 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato |
| **Label** | S86.6.4 | S86.6.5 | S86.6.6 | S86.7.1 | S86.7.2 | S86.7.3 | S86.7.4 | S86.7.6 | S86.8.1 | S86.8.3 |
| **Na2O** | 3.84 | 3.98 | 4.06 | 4.18 | 4.16 | 4.19 | 3.84 | 3.89 | 3.81 | 3.96 |
| **MgO** | 0.04 | 0.05 | 0.01 | 0.03 | 0.04 | 0.00 | 0.01 | 0.04 | 0.04 | 0.03 |
| **Al2O3** | 13.04 | 13.36 | 13.07 | 12.70 | 13.03 | 13.07 | 13.10 | 13.16 | 12.68 | 12.62 |
| **SiO2** | 73.75 | 74.88 | 74.87 | 73.01 | 74.49 | 74.69 | 74.14 | 74.86 | 74.23 | 74.73 |
| **P2O5** | 0.02 | 0.06 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.07 | 0.03 |
| **ClO2** | 0.37 | 0.37 | 0.41 | 0.36 | 0.36 | 0.43 | 0.38 | 0.35 | 0.40 | 0.32 |
| **K2O** | 5.08 | 5.10 | 5.02 | 4.86 | 4.98 | 5.05 | 5.18 | 5.43 | 5.09 | 4.99 |
| **CaO** | 0.79 | 0.72 | 0.74 | 0.78 | 0.76 | 0.79 | 0.74 | 0.68 | 0.74 | 0.75 |
| **TiO2** | 0.08 | 0.08 | 0.13 | 0.07 | 0.03 | 0.04 | 0.03 | 0.09 | 0.04 | 0.11 |
| **MnO** | 0.07 | 0.08 | 0.05 | 0.06 | 0.05 | 0.05 | 0.04 | 0.21 | 0.05 | 0.10 |
| **FeOt** | 1.56 | 1.68 | 1.60 | 1.71 | 1.66 | 1.74 | 1.57 | 1.50 | 1.71 | 1.66 |
| **Total** | 98.64 | 100.38 | 99.96 | 97.77 | 99.57 | 100.05 | 99.03 | 100.20 | 98.85 | 99.28 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | M.Pilato | Palizzi | Palizzi | Palizzi |
| **Label** | S86.8.4 | S86.8.6 | S86.9.1 | S86.9.3 | S86.9.4 | S86.9.5 | S86.9.6 | AT17.1.1 | AT17.1.2 | AT17.1.3 |
| **Na2O** | 4.16 | 3.79 | 3.85 | 3.98 | 4.04 | 4.14 | 4.11 | 3.96 | 3.85 | 3.97 |
| **MgO** | 0.02 | 0.01 | 0.02 | 0.05 | 0.02 | 0.01 | 0.03 | 0.10 | 0.12 | 0.12 |
| **Al2O3** | 13.06 | 13.01 | 12.89 | 13.01 | 13.04 | 13.18 | 13.01 | 13.30 | 13.22 | 13.40 |
| **SiO2** | 73.94 | 74.71 | 73.82 | 74.02 | 74.15 | 74.54 | 74.78 | 70.08 | 70.68 | 71.31 |
| **P2O5** | 0.03 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.04 | 0.05 | 0.01 |
| **ClO2** | 0.36 | 0.38 | 0.42 | 0.37 | 0.38 | 0.35 | 0.39 | | | |
| **K2O** | 5.12 | 4.88 | 4.96 | 5.07 | 5.16 | 5.24 | 4.95 | 5.41 | 5.25 | 5.37 |
| **CaO** | 0.76 | 0.69 | 0.76 | 0.77 | 0.75 | 0.73 | 0.75 | 0.83 | 0.83 | 0.76 |
| **TiO2** | 0.08 | 0.11 | 0.05 | 0.05 | 0.06 | 0.05 | 0.09 | 0.12 | 0.13 | 0.10 |
| **MnO** | 0.14 | 0.03 | 0.09 | 0.14 | 0.17 | 0.10 | 0.06 | 0.10 | 0.00 | 0.07 |
| **FeOt** | 1.58 | 1.45 | 1.67 | 1.74 | 1.60 | 1.46 | 1.86 | 1.89 | 2.02 | 1.97 |
| **Total** | 99.24 | 99.05 | 98.56 | 99.21 | 99.38 | 99.80 | 100.02 | 95.83 | 96.14 | 97.07 |

| Date Analysed | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | AT17.10.2 | AT17.11.1 | AT17.12.1 | AT17.12.2 | AT17.13.1 | AT17.14.1 | AT17.14.2 | AT17.15.1 | AT17.16.1 | AT17.2.1 |
| **Na2O** | 3.67 | 4.10 | 3.87 | 3.72 | 4.02 | 4.17 | 3.95 | 4.11 | 2.95 | 4.07 |
| **MgO** | 0.12 | 0.11 | 0.10 | 0.11 | 0.11 | 0.06 | 0.10 | 0.09 | 0.06 | 0.10 |
| **Al2O3** | 12.92 | 13.65 | 13.11 | 13.19 | 13.17 | 13.47 | 13.28 | 12.89 | 13.67 | 12.86 |
| **SiO2** | 70.28 | 71.33 | 70.04 | 72.09 | 70.16 | 72.09 | 72.28 | 71.02 | 71.80 | 70.00 |
| **P2O5** | 0.00 | 0.02 | 0.04 | 0.05 | 0.09 | 0.03 | 0.00 | 0.00 | 0.07 | 0.00 |
| **ClO2** | | | | | | | | | | |
| **K2O** | 5.39 | 5.56 | 5.42 | 5.36 | 5.33 | 5.42 | 5.39 | 5.28 | 5.18 | 5.23 |
| **CaO** | 0.80 | 0.79 | 0.72 | 0.71 | 0.81 | 0.81 | 0.77 | 0.80 | 0.76 | 0.80 |
| **TiO2** | 0.07 | 0.16 | 0.12 | 0.08 | 0.14 | 0.13 | 0.11 | 0.12 | 0.13 | 0.13 |
| **MnO** | 0.06 | 0.08 | 0.06 | 0.12 | 0.06 | 0.09 | 0.00 | 0.08 | 0.13 | 0.06 |
| **FeOt** | 1.75 | 2.06 | 1.91 | 1.69 | 2.02 | 1.75 | 1.81 | 1.60 | 1.89 | 1.81 |
| **Total** | 95.07 | 97.86 | 95.39 | 97.12 | 95.90 | 98.03 | 97.68 | 96.00 | 96.65 | 95.07 |

| Date Analysed | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | AT17.2.2 | AT17.2.3 | AT17.3.1 | AT17.3.2 | AT17.4.1 | AT17.4.2 | AT17.4.3 | AT17.5.2 | AT17.5.3 | AT17.6.1 |
| **Na2O** | 3.87 | 4.19 | 4.19 | 4.14 | 3.82 | 3.79 | 3.86 | 4.10 | 3.91 | 3.97 |
| **MgO** | 0.09 | 0.10 | 0.04 | 0.04 | 0.10 | 0.07 | 0.05 | 0.14 | 0.12 | 0.05 |
| **Al2O3** | 12.63 | 13.91 | 13.81 | 13.63 | 12.89 | 12.81 | 12.86 | 13.53 | 13.57 | 12.81 |
| **SiO2** | 71.61 | 70.61 | 70.99 | 70.08 | 71.07 | 71.03 | 71.42 | 71.14 | 70.61 | 72.15 |
| **P2O5** | 0.00 | 0.02 | 0.01 | 0.11 | 0.00 | 0.08 | 0.04 | 0.07 | 0.02 | 0.00 |
| **ClO2** | | | | | | | | | | |
| **K2O** | 5.40 | 5.36 | 5.14 | 5.60 | 5.23 | 5.07 | 5.30 | 5.30 | 5.30 | 5.18 |
| **CaO** | 0.68 | 0.83 | 0.78 | 0.69 | 0.69 | 0.69 | 0.72 | 0.91 | 0.82 | 0.65 |
| **TiO2** | 0.07 | 0.12 | 0.11 | 0.15 | 0.03 | 0.10 | 0.10 | 0.15 | 0.14 | 0.10 |
| **MnO** | 0.06 | 0.16 | 0.00 | 0.00 | 0.16 | 0.05 | 0.00 | 0.06 | 0.08 | 0.06 |
| **FeOt** | 1.85 | 2.01 | 1.38 | 1.37 | 1.64 | 1.66 | 1.64 | 2.27 | 1.87 | 1.48 |
| **Total** | 96.26 | 97.32 | 96.45 | 95.81 | 95.62 | 95.36 | 96.00 | 97.67 | 96.44 | 96.46 |

| Date Analysed | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 |
| **Label** | AT17.6.2 | AT17.7.2 | AT17.8.1 | AT17.8.2 | AT17.9.1 | AT17.9.2 | GAT3.1.g1 | GAT3.1.g2 | GAT3.1.g3 | GAT3.1.g4 |
| **Na2O** | 3.97 | 3.93 | 3.95 | 3.86 | 3.98 | 3.84 | 4.33 | 4.50 | 4.42 | 4.53 |
| **MgO** | 0.06 | 0.18 | 0.05 | 0.08 | 0.05 | 0.07 | 2.30 | 2.33 | 2.32 | 2.27 |
| **Al2O3** | 12.65 | 13.53 | 13.04 | 13.14 | 13.08 | 12.94 | 17.88 | 18.00 | 17.88 | 17.82 |
| **SiO2** | 71.51 | 69.93 | 72.57 | 71.86 | 71.16 | 72.01 | 55.15 | 54.75 | 55.02 | 55.02 |
| **P2O5** | 0.02 | 0.07 | 0.00 | 0.00 | 0.03 | 0.00 | 0.63 | 0.60 | 0.60 | 0.58 |
| **ClO2** | | | | | | | 0.29 | 0.25 | 0.26 | 0.29 |
| **K2O** | 5.34 | 5.26 | 5.31 | 5.25 | 5.32 | 5.10 | 6.76 | 6.72 | 6.83 | 6.70 |
| **CaO** | 0.74 | 0.86 | 0.72 | 0.71 | 0.73 | 0.74 | 4.73 | 4.80 | 4.81 | 4.86 |
| **TiO2** | 0.09 | 0.14 | 0.11 | 0.09 | 0.11 | 0.15 | 0.65 | 0.67 | 0.58 | 0.64 |
| **MnO** | 0.08 | 0.12 | 0.09 | 0.09 | 0.05 | 0.14 | 0.01 | 0.16 | 0.09 | 0.20 |
| **FeOt** | 1.65 | 2.14 | 1.60 | 1.93 | 1.68 | 1.65 | 7.12 | 6.68 | 6.79 | 6.35 |
| **Total** | 96.11 | 96.16 | 97.44 | 97.02 | 96.18 | 96.67 | 99.84 | 99.46 | 99.60 | 99.25 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 |
| **Label** | GAT3.1.g5 | GAT3.1.g6 | GAT3.1.g7 | GAT3.10.g2 | GAT3.10.g3 | GAT3.10.g4 | GAT3.10.g5 | GAT3.11.g1 | GAT3.11.g2 | GAT3.11.g3 |
| **Na2O** | 4.30 | 4.56 | 4.64 | 4.29 | 4.46 | 4.55 | 4.43 | 4.48 | 4.52 | 4.37 |
| **MgO** | 2.33 | 2.30 | 2.27 | 2.24 | 2.29 | 2.46 | 2.21 | 2.36 | 2.53 | 2.36 |
| **Al2O3** | 17.67 | 17.88 | 17.09 | 16.84 | 17.86 | 17.80 | 17.46 | 17.57 | 17.65 | 17.49 |
| **SiO2** | 55.04 | 55.07 | 54.33 | 53.13 | 53.72 | 55.05 | 54.75 | 54.81 | 55.10 | 54.93 |
| **P2O5** | 0.61 | 0.60 | 0.61 | 0.52 | 0.62 | 0.60 | 0.57 | 0.62 | 0.62 | 0.62 |
| **ClO2** | 0.26 | 0.27 | 0.27 | 0.27 | 0.27 | 0.25 | 0.28 | 0.30 | 0.26 | 0.28 |
| **K2O** | 6.79 | 6.71 | 6.78 | 6.52 | 6.55 | 6.63 | 6.67 | 6.72 | 6.59 | 6.83 |
| **CaO** | 4.91 | 4.69 | 4.63 | 4.50 | 4.81 | 4.74 | 4.64 | 5.06 | 5.12 | 5.08 |
| **TiO2** | 0.63 | 0.62 | 0.61 | 0.60 | 0.59 | 0.61 | 0.57 | 0.61 | 0.58 | 0.66 |
| **MnO** | 0.19 | 0.20 | 0.21 | 0.20 | 0.18 | 0.16 | 0.13 | 0.11 | 0.17 | 0.17 |
| **FeOt** | 6.81 | 6.68 | 6.71 | 6.59 | 6.49 | 6.80 | 6.72 | 7.09 | 6.73 | 6.63 |
| **Total** | 99.53 | 99.59 | 98.14 | 95.70 | 97.85 | 99.67 | 98.43 | 99.73 | 99.88 | 99.41 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 |
| **Label** | GAT3.12.g1 | GAT3.12.g2 | GAT3.12.g3 | GAT3.12.g4 | GAT3.13.g1 | GAT3.13.g2 | GAT3.13.g3 | GAT3.13.g4 | GAT3.13.g5 | GAT3.14.g1 |
| **Na2O** | 4.30 | 4.65 | 4.52 | 4.39 | 4.84 | 4.37 | 4.23 | 4.64 | 4.32 | 4.45 |
| **MgO** | 2.39 | 2.42 | 2.51 | 2.53 | 2.55 | 2.57 | 2.47 | 2.50 | 2.51 | 2.32 |
| **Al2O3** | 17.71 | 17.77 | 17.63 | 17.40 | 17.46 | 17.59 | 17.72 | 17.59 | 17.71 | 17.72 |
| **SiO2** | 55.26 | 54.76 | 54.85 | 55.04 | 54.59 | 54.98 | 54.25 | 54.65 | 54.78 | 55.01 |
| **P2O5** | 0.59 | 0.63 | 0.64 | 0.60 | 0.58 | 0.61 | 0.59 | 0.59 | 0.57 | 0.63 |
| **ClO2** | 0.29 | 0.23 | 0.27 | 0.29 | 0.28 | 0.29 | 0.29 | 0.27 | 0.29 | 0.29 |
| **K2O** | 6.69 | 6.93 | 6.66 | 6.64 | 6.66 | 6.59 | 6.72 | 6.79 | 6.63 | 6.66 |
| **CaO** | 4.80 | 4.73 | 5.01 | 5.02 | 5.07 | 5.08 | 5.04 | 4.98 | 5.13 | 4.84 |
| **TiO2** | 0.66 | 0.68 | 0.63 | 0.66 | 0.59 | 0.62 | 0.57 | 0.59 | 0.60 | 0.64 |
| **MnO** | 0.09 | 0.14 | 0.11 | 0.15 | 0.16 | 0.10 | 0.15 | 0.19 | 0.18 | 0.18 |
| **FeOt** | 6.79 | 6.58 | 6.60 | 6.97 | 6.99 | 7.04 | 7.27 | 6.87 | 6.94 | 7.14 |
| **Total** | 99.57 | 99.52 | 99.43 | 99.68 | 99.76 | 99.83 | 99.30 | 99.67 | 99.65 | 99.87 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 |
| **Label** | GAT3.14.g2 | GAT3.14.g3 | GAT3.15.g1 | GAT3.15.g2 | GAT3.15.g3 | GAT3.2.g1 | GAT3.2.g2 | GAT3.2.g4 | GAT3.2.g5 | GAT3.3.g1 |
| **Na2O** | 4.64 | 4.64 | 4.46 | 4.55 | 4.41 | 4.53 | 4.52 | 4.41 | 4.44 | 4.39 |
| **MgO** | 2.35 | 2.46 | 2.52 | 2.53 | 2.57 | 2.27 | 2.35 | 2.40 | 2.36 | 2.30 |
| **Al2O3** | 17.75 | 17.70 | 17.81 | 17.43 | 17.26 | 17.28 | 17.74 | 17.77 | 17.61 | 17.69 |
| **SiO2** | 55.41 | 55.09 | 54.63 | 55.63 | 54.14 | 53.50 | 54.79 | 55.59 | 55.17 | 55.07 |
| **P2O5** | 0.59 | 0.64 | 0.58 | 0.64 | 0.60 | 0.56 | 0.60 | 0.62 | 0.63 | 0.61 |
| **ClO2** | 0.28 | 0.26 | 0.31 | 0.28 | 0.32 | 0.30 | 0.29 | 0.29 | 0.31 | 0.29 |
| **K2O** | 6.67 | 6.83 | 6.74 | 6.75 | 6.58 | 6.58 | 6.69 | 6.79 | 6.65 | 6.77 |
| **CaO** | 4.81 | 4.82 | 5.03 | 5.25 | 5.07 | 4.87 | 5.12 | 5.06 | 4.90 | 4.69 |
| **TiO2** | 0.62 | 0.66 | 0.62 | 0.65 | 0.62 | 0.62 | 0.56 | 0.67 | 0.67 | 0.70 |
| **MnO** | 0.14 | 0.22 | 0.14 | 0.10 | 0.14 | 0.14 | 0.18 | 0.17 | 0.28 | 0.19 |
| **FeOt** | 6.81 | 6.90 | 6.93 | 6.63 | 6.89 | 7.02 | 6.92 | 6.84 | 6.78 | 6.52 |
| **Total** | 100.06 | 100.22 | 99.74 | 100.44 | 98.60 | 97.67 | 99.76 | 100.61 | 99.80 | 99.23 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 |
| **Label** | GAT3.3.g2 | GAT3.3.g3 | GAT3.3.g4 | GAT3.3.g5 | GAT3.4.g1 | GAT3.4.g2 | GAT3.4.g3 | GAT3.4.g4 | GAT3.4.g5 | GAT3.4.g6 |
| **Na2O** | 4.63 | 4.44 | 4.57 | 4.37 | 4.32 | 4.57 | 4.39 | 4.39 | 4.39 | 4.27 |
| **MgO** | 2.20 | 2.23 | 2.35 | 2.34 | 2.40 | 2.51 | 2.59 | 2.29 | 2.56 | 2.48 |
| **Al2O3** | 17.74 | 17.87 | 17.88 | 17.47 | 18.00 | 17.44 | 17.75 | 17.01 | 17.43 | 17.67 |
| **SiO2** | 55.20 | 55.03 | 55.19 | 55.68 | 54.67 | 54.20 | 54.46 | 55.28 | 54.68 | 54.53 |
| **P2O5** | 0.61 | 0.64 | 0.62 | 0.67 | 0.62 | 0.62 | 0.64 | 0.58 | 0.60 | 0.59 |
| **ClO2** | 0.31 | 0.30 | 0.31 | 0.31 | 0.29 | 0.30 | 0.30 | 0.25 | 0.31 | 0.30 |
| **K2O** | 6.85 | 6.71 | 6.79 | 6.78 | 6.55 | 6.60 | 6.57 | 6.63 | 6.69 | 6.67 |
| **CaO** | 4.76 | 4.78 | 4.78 | 4.77 | 5.27 | 5.24 | 5.18 | 4.94 | 5.12 | 5.10 |
| **TiO2** | 0.59 | 0.65 | 0.65 | 0.60 | 0.70 | 0.63 | 0.64 | 0.55 | 0.67 | 0.67 |
| **MnO** | 0.14 | 0.12 | 0.07 | 0.19 | 0.02 | 0.10 | 0.04 | 0.16 | 0.22 | 0.16 |
| **FeOt** | 6.41 | 6.63 | 6.85 | 6.49 | 7.06 | 6.81 | 6.71 | 6.55 | 6.82 | 6.44 |
| **Total** | 99.43 | 99.40 | 100.06 | 99.66 | 99.91 | 99.04 | 99.27 | 98.63 | 99.48 | 98.87 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 |
| **Label** | GAT3.5.g1 | GAT3.5.g2 | GAT3.5.g3 | GAT3.5.g4 | GAT3.6.g1 | GAT3.6.g2 | GAT3.6.g3 | GAT3.6.g4 | GAT3.6.g5 | GAT3.7.g1 |
| **Na2O** | 4.23 | 4.41 | 4.41 | 4.13 | 4.61 | 4.35 | 4.49 | 4.29 | 4.69 | 4.17 |
| **MgO** | 2.59 | 2.43 | 2.34 | 2.45 | 2.54 | 2.53 | 2.51 | 2.50 | 2.50 | 2.46 |
| **Al2O3** | 17.63 | 17.13 | 17.37 | 17.54 | 18.05 | 17.11 | 17.57 | 17.45 | 17.41 | 17.64 |
| **SiO2** | 54.91 | 55.06 | 55.24 | 54.47 | 54.47 | 54.17 | 54.47 | 54.61 | 54.47 | 54.83 |
| **P2O5** | 0.66 | 0.62 | 0.60 | 0.59 | 0.58 | 0.61 | 0.62 | 0.64 | 0.67 | 0.56 |
| **ClO2** | 0.30 | 0.30 | 0.28 | 0.30 | 0.33 | 0.29 | 0.28 | 0.30 | 0.29 | 0.29 |
| **K2O** | 6.64 | 6.52 | 6.64 | 6.60 | 6.62 | 6.73 | 6.52 | 6.67 | 6.61 | 6.41 |
| **CaO** | 5.01 | 4.90 | 4.98 | 5.07 | 5.00 | 5.06 | 5.10 | 5.07 | 5.17 | 4.86 |
| **TiO2** | 0.70 | 0.71 | 0.63 | 0.64 | 0.66 | 0.72 | 0.61 | 0.58 | 0.63 | 0.66 |
| **MnO** | 0.17 | 0.15 | 0.12 | 0.24 | 0.12 | 0.12 | 0.14 | 0.14 | 0.14 | 0.14 |
| **FeOt** | 6.94 | 6.77 | 6.56 | 6.85 | 6.88 | 6.63 | 6.78 | 7.02 | 7.13 | 6.74 |
| **Total** | 99.76 | 99.00 | 99.18 | 98.88 | 99.85 | 98.32 | 99.10 | 99.28 | 99.70 | 98.76 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 |
| **Label** | GAT3.7.g2 | GAT3.7.g3 | GAT3.7.g4 | GAT3.7.g5 | GAT3.8.g1 | GAT3.8.g2 | GAT3.8.g3 | GAT3.8.g4 | GAT3.8.g5 | GAT3.9.g1 |
| **Na2O** | 4.29 | 4.34 | 4.51 | 4.53 | 4.47 | 4.64 | 4.38 | 4.56 | 4.27 | 4.28 |
| **MgO** | 2.61 | 2.43 | 2.43 | 2.51 | 2.25 | 2.26 | 2.36 | 2.32 | 2.38 | 2.47 |
| **Al2O3** | 17.72 | 17.72 | 17.57 | 17.92 | 17.78 | 17.79 | 17.40 | 17.39 | 17.98 | 17.96 |
| **SiO2** | 54.51 | 54.83 | 54.82 | 54.40 | 55.12 | 55.22 | 54.73 | 54.57 | 54.68 | 54.50 |
| **P2O5** | 0.61 | 0.61 | 0.57 | 0.60 | 0.59 | 0.67 | 0.68 | 0.62 | 0.56 | 0.63 |
| **ClO2** | 0.26 | 0.27 | 0.28 | 0.29 | 0.28 | 0.29 | 0.30 | 0.27 | 0.30 | 0.27 |
| **K2O** | 6.50 | 6.53 | 6.53 | 6.60 | 6.85 | 6.81 | 6.81 | 6.84 | 6.51 | 6.75 |
| **CaO** | 5.25 | 4.99 | 4.83 | 4.94 | 4.79 | 4.86 | 4.88 | 4.82 | 5.01 | 5.13 |
| **TiO2** | 0.66 | 0.65 | 0.59 | 0.66 | 0.59 | 0.62 | 0.61 | 0.67 | 0.59 | 0.59 |
| **MnO** | 0.17 | 0.20 | 0.15 | 0.15 | 0.06 | 0.09 | 0.23 | 0.25 | 0.20 | 0.15 |
| **FeOt** | 7.60 | 6.76 | 6.82 | 6.67 | 6.41 | 6.60 | 6.65 | 6.89 | 6.83 | 6.99 |
| **Total** | 100.17 | 99.33 | 99.07 | 99.28 | 99.19 | 99.85 | 99.03 | 99.19 | 99.31 | 99.73 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 |
| **Label** | GAT3.9.g2 | GAT3.9.g3 | AT3.12.1 | AT3.12.2 | AT3.12.3 | AT3.13.1 | AT3.13.2 | AT3.2.1 | AT3.2.2 | AT3.2.3 |
| **Na2O** | 4.66 | 4.46 | 4.36 | 4.42 | 4.32 | 4.50 | 4.31 | 4.65 | 4.78 | 4.69 |
| **MgO** | 2.68 | 2.47 | 1.92 | 2.32 | 2.33 | 2.47 | 2.48 | 2.47 | 2.13 | 2.35 |
| **Al2O3** | 17.53 | 18.36 | 17.66 | 17.27 | 17.45 | 17.10 | 17.25 | 16.94 | 17.33 | 17.19 |
| **SiO2** | 54.67 | 54.69 | 55.03 | 54.78 | 54.47 | 54.09 | 54.51 | 54.47 | 55.41 | 54.42 |
| **P2O5** | 0.57 | 0.63 | 0.66 | 0.63 | 0.59 | 0.54 | 0.53 | 0.55 | 0.60 | 0.53 |
| **ClO2** | 0.32 | 0.29 | 0.30 | 0.29 | 0.30 | 0.31 | 0.31 | 0.33 | 0.31 | 0.32 |
| **K2O** | 6.64 | 6.67 | 6.86 | 6.50 | 6.57 | 6.33 | 6.37 | 6.44 | 6.69 | 6.53 |
| **CaO** | 5.02 | 5.14 | 4.23 | 4.92 | 5.11 | 5.27 | 5.01 | 5.24 | 4.57 | 5.10 |
| **TiO2** | 0.67 | 0.62 | 0.70 | 0.63 | 0.65 | 0.59 | 0.72 | 0.68 | 0.65 | 0.59 |
| **MnO** | 0.16 | 0.21 | 0.17 | 0.09 | 0.20 | 0.16 | 0.13 | 0.21 | 0.08 | 0.13 |
| **FeOt** | 7.01 | 6.96 | 6.61 | 6.99 | 6.89 | 6.91 | 6.50 | 7.12 | 6.74 | 7.17 |
| **Total** | 99.93 | 100.49 | 98.50 | 98.84 | 98.89 | 98.26 | 98.13 | 99.10 | 99.28 | 99.00 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
| **Eruptive Unit** | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 |
| **Label** | AT3.2.5 | AT3.2.6 | AT3.3.1 | AT3.3.2 | AT3.3.3 | AT3.4.1 | AT3.4.2 | AT3.5.1 | AT3.5.2 | AT3.5.3 |
| **Na2O** | 4.41 | 4.80 | 4.44 | 4.38 | 4.36 | 4.58 | 4.89 | 4.58 | 4.28 | 4.64 |
| **MgO** | 2.43 | 2.31 | 2.40 | 2.33 | 2.43 | 2.34 | 2.35 | 2.30 | 2.45 | 2.25 |
| **Al2O3** | 16.71 | 17.10 | 17.24 | 17.61 | 16.79 | 16.90 | 16.59 | 17.29 | 17.31 | 17.70 |
| **SiO2** | 53.53 | 54.01 | 55.16 | 55.02 | 54.25 | 54.22 | 53.93 | 54.20 | 54.85 | 55.10 |
| **P2O5** | 0.60 | 0.63 | 0.59 | 0.55 | 0.60 | 0.56 | 0.57 | 0.59 | 0.54 | 0.54 |
| **ClO2** | 0.30 | 0.25 | 0.32 | 0.29 | 0.30 | 0.29 | 0.34 | 0.33 | 0.28 | 0.28 |
| **K2O** | 6.46 | 6.76 | 6.55 | 6.50 | 6.68 | 6.49 | 6.38 | 6.49 | 6.52 | 6.65 |
| **CaO** | 5.17 | 4.76 | 5.05 | 4.88 | 4.79 | 4.69 | 5.09 | 5.04 | 5.09 | 4.85 |
| **TiO2** | 0.57 | 0.66 | 0.60 | 0.59 | 0.68 | 0.77 | 0.82 | 0.65 | 0.62 | 0.62 |
| **MnO** | 0.09 | 0.16 | 0.18 | 0.20 | 0.00 | 0.24 | 0.11 | 0.17 | 0.16 | 0.11 |
| **FeOt** | 6.76 | 6.83 | 6.67 | 6.66 | 6.84 | 7.38 | 7.50 | 6.96 | 7.18 | 6.74 |
| **Total** | 97.03 | 98.27 | 99.23 | 99.01 | 97.73 | 98.47 | 98.57 | 98.60 | 99.28 | 99.47 |
| **Date Analysed** | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.10.20 |
| **Eruptive Unit** | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello 2 | Vulcanello Platform |
| **Label** | AT3.6.1 | AT3.6.2 | AT3.6.3 | AT3.7.1 | AT3.7.2 | AT3.7.3 | AT3.9.1 | AT3.9.2 | AT3.9.3 | AT16.18.2 |
| **Na2O** | 4.56 | 4.55 | 4.76 | 4.55 | 4.59 | 4.43 | 4.43 | 4.81 | 4.25 | 6.42 |
| **MgO** | 2.10 | 2.14 | 2.21 | 2.19 | 2.14 | 2.02 | 2.56 | 2.54 | 2.17 | 0.01 |
| **Al2O3** | 17.57 | 17.78 | 17.54 | 16.88 | 17.49 | 17.74 | 17.40 | 16.96 | 17.06 | 20.19 |
| **SiO2** | 54.94 | 54.90 | 54.88 | 53.60 | 54.97 | 55.49 | 54.26 | 53.88 | 55.05 | 64.04 |
| **P2O5** | 0.58 | 0.55 | 0.59 | 0.61 | 0.59 | 0.51 | 0.63 | 0.54 | 0.58 | 0.07 |
| **ClO2** | 0.30 | 0.31 | 0.31 | 0.32 | 0.29 | 0.32 | 0.31 | 0.28 | 0.28 | 0.00 |
| **K2O** | 6.59 | 6.73 | 6.63 | 6.72 | 6.65 | 6.77 | 6.40 | 6.25 | 6.43 | 6.00 |
| **CaO** | 4.75 | 4.79 | 4.73 | 4.73 | 4.73 | 4.75 | 5.20 | 5.09 | 4.65 | 1.69 |
| **TiO2** | 0.63 | 0.62 | 0.59 | 0.66 | 0.65 | 0.60 | 0.62 | 0.62 | 0.65 | 0.07 |
| **MnO** | 0.15 | 0.16 | 0.13 | 0.20 | 0.07 | 0.21 | 0.23 | 0.18 | 0.07 | 0.00 |
| **FeOt** | 6.89 | 6.62 | 7.00 | 6.82 | 6.73 | 6.69 | 6.73 | 6.77 | 6.52 | 0.51 |
| **Total** | 99.05 | 99.14 | 99.38 | 97.27 | 98.90 | 99.52 | 98.78 | 97.92 | 97.71 | 99.01 |
| **Date Analysed** | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
| **Eruptive Unit** | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | AT16.18.3 | AT16.18.4 | AT16.18.5 | AT8.1.1 | AT8.10.1 | AT8.11.1 | AT8.11.2 | AT8.13.1 | AT8.2.2 | AT8.2.3 |
| **Na2O** | 6.60 | 5.44 | 5.21 | 4.79 | 5.38 | 5.33 | 5.18 | 4.71 | 5.41 | 4.96 |
| **MgO** | 0.00 | 0.00 | 0.01 | 1.69 | 1.58 | 1.56 | 1.55 | 2.24 | 1.22 | 1.45 |
| **Al2O3** | 20.52 | 19.81 | 19.46 | 17.95 | 18.03 | 18.07 | 18.91 | 17.53 | 19.61 | 18.51 |
| **SiO2** | 63.16 | 64.01 | 65.38 | 53.87 | 55.26 | 54.88 | 55.75 | 54.77 | 55.68 | 55.85 |
| **P2O5** | 0.03 | 0.07 | 0.04 | 0.62 | 0.51 | 0.58 | 0.53 | 0.73 | 0.40 | 0.51 |
| **ClO2** | 0.02 | 0.03 | 0.01 | 0.39 | 0.37 | 0.28 | 0.31 | 0.51 | 0.24 | 0.28 |
| **K2O** | 5.21 | 7.57 | 7.67 | 6.57 | 6.41 | 6.71 | 5.77 | 5.65 | 5.60 | 6.04 |
| **CaO** | 2.02 | 1.17 | 0.94 | 3.35 | 3.66 | 3.63 | 4.47 | 4.10 | 4.81 | 4.20 |
| **TiO2** | 0.06 | 0.08 | 0.09 | 0.70 | 0.56 | 0.54 | 0.51 | 0.71 | 0.51 | 0.55 |
| **MnO** | 0.00 | 0.01 | 0.00 | 0.13 | 0.17 | 0.14 | 0.09 | 0.19 | 0.02 | 0.16 |
| **FeOt** | 0.55 | 0.35 | 0.39 | 7.28 | 5.92 | 6.02 | 5.10 | 7.29 | 4.89 | 5.32 |
| **Total** | 98.18 | 98.54 | 99.20 | 97.35 | 97.85 | 97.75 | 98.18 | 98.42 | 98.39 | 97.84 |
| **Date Analysed** | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | AT8.3.1 | AT8.4.1 | AT8.4.2 | AT8.6.1 | AT8.6.2 | AT8.7.1 | AT8.7.2 | AT8.9.1 | AT8.9.2 | AT6.1.1 |
| **Na2O** | 5.01 | 5.42 | 5.33 | 5.31 | 5.06 | 4.98 | 4.93 | 5.09 | 5.10 | 4.60 |
| **MgO** | 1.44 | 1.73 | 1.62 | 1.73 | 1.60 | 1.83 | 1.88 | 1.67 | 1.77 | 1.87 |
| **Al2O3** | 18.97 | 18.17 | 17.99 | 17.89 | 17.35 | 17.90 | 17.99 | 18.15 | 18.20 | 17.72 |
| **SiO2** | 55.44 | 54.48 | 55.26 | 55.22 | 54.38 | 54.30 | 54.98 | 55.28 | 54.46 | 55.15 |
| **P2O5** | 0.47 | 0.56 | 0.53 | 0.58 | 1.28 | 0.58 | 0.55 | 0.55 | 0.57 | 0.59 |
| **ClO2** | 0.25 | 0.30 | 0.29 | 0.32 | 0.37 | 0.34 | 0.29 | 0.32 | 0.35 | 0.30 |
| **K2O** | 5.32 | 6.85 | 6.76 | 6.73 | 6.36 | 6.32 | 6.53 | 6.60 | 6.64 | 6.57 |
| **CaO** | 4.88 | 3.79 | 3.59 | 3.68 | 4.59 | 4.25 | 4.05 | 3.79 | 3.93 | 4.17 |
| **TiO2** | 0.50 | 0.59 | 0.53 | 0.63 | 0.61 | 0.59 | 0.61 | 0.59 | 0.58 | 0.63 |
| **MnO** | 0.16 | 0.11 | 0.20 | 0.23 | 0.19 | 0.10 | 0.14 | 0.13 | 0.17 | 0.17 |
| **FeOt** | 5.55 | 6.31 | 5.82 | 6.04 | 5.83 | 6.19 | 6.33 | 6.21 | 6.29 | 6.43 |
| **Total** | 97.99 | 98.32 | 97.91 | 98.36 | 97.62 | 97.38 | 98.27 | 98.39 | 98.05 | 98.21 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | AT6.1.2 | AT6.1.3 | AT6.10.1 | AT6.10.2 | AT6.11.1 | AT6.12.1 | AT6.12.2 | AT6.13.1 | AT6.13.2 | AT6.14.1 |
| **Na2O** | 4.75 | 4.79 | 4.77 | 4.80 | 4.52 | 4.90 | 4.79 | 4.92 | 4.79 | 4.43 |
| **MgO** | 1.89 | 1.84 | 1.73 | 2.00 | 2.00 | 1.69 | 1.74 | 1.99 | 1.79 | 1.89 |
| **Al2O3** | 17.62 | 17.91 | 17.76 | 17.39 | 17.80 | 17.68 | 17.58 | 17.55 | 17.85 | 17.71 |
| **SiO2** | 55.27 | 55.41 | 54.66 | 54.29 | 54.63 | 54.91 | 55.02 | 54.37 | 54.59 | 54.98 |
| **P2O5** | 0.62 | 0.61 | 0.60 | 0.55 | 0.56 | 0.56 | 0.63 | 0.59 | 0.58 | 0.58 |
| **ClO2** | 0.33 | 0.30 | 0.33 | 0.31 | 0.32 | 0.34 | 0.33 | 0.33 | 0.32 | 0.32 |
| **K2O** | 6.62 | 6.95 | 7.10 | 6.52 | 6.67 | 6.76 | 6.83 | 6.77 | 6.76 | 6.69 |
| **CaO** | 4.10 | 3.78 | 3.93 | 4.55 | 4.13 | 4.12 | 3.93 | 4.21 | 3.97 | 4.14 |
| **TiO2** | 0.59 | 0.63 | 0.66 | 0.61 | 0.57 | 0.61 | 0.67 | 0.63 | 0.75 | 0.67 |
| **MnO** | 0.14 | 0.18 | 0.11 | 0.21 | 0.09 | 0.21 | 0.16 | 0.22 | 0.14 | 0.18 |
| **FeOt** | 6.59 | 6.12 | 6.35 | 6.63 | 6.60 | 6.46 | 6.42 | 6.52 | 6.24 | 6.43 |
| **Total** | 98.52 | 98.52 | 97.99 | 97.86 | 97.89 | 98.24 | 98.10 | 98.10 | 97.78 | 98.01 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | AT6.14.2 | AT6.15.1 | AT6.15.3 | AT6.2.1 | AT6.2.2 | AT6.2.3 | AT6.3.2 | AT6.3.3 | AT6.4.1 | AT6.4.2 |
| **Na2O** | 4.65 | 4.75 | 4.92 | 4.95 | 4.42 | 4.57 | 4.48 | 4.99 | 4.65 | 4.43 |
| **MgO** | 1.82 | 1.82 | 1.82 | 1.77 | 1.96 | 1.86 | 1.82 | 1.87 | 1.98 | 1.78 |
| **Al2O3** | 17.75 | 17.51 | 17.51 | 17.74 | 17.44 | 17.77 | 17.81 | 17.57 | 17.58 | 17.72 |
| **SiO2** | 54.89 | 54.24 | 55.11 | 54.96 | 54.71 | 54.94 | 54.06 | 54.45 | 54.97 | 54.86 |
| **P2O5** | 0.59 | 0.61 | 0.60 | 0.57 | 0.58 | 0.58 | 0.62 | 0.60 | 0.60 | 0.57 |
| **ClO2** | 0.33 | 0.30 | 0.34 | 0.26 | 0.31 | 0.29 | 0.33 | 0.31 | 0.32 | 0.22 |
| **K2O** | 6.75 | 6.93 | 6.69 | 6.61 | 6.56 | 6.85 | 6.81 | 6.57 | 6.59 | 6.84 |
| **CaO** | 4.19 | 3.91 | 4.13 | 4.00 | 4.12 | 4.04 | 4.01 | 4.21 | 4.17 | 3.98 |
| **TiO2** | 0.56 | 0.63 | 0.63 | 0.59 | 0.58 | 0.58 | 0.58 | 0.63 | 0.65 | 0.62 |
| **MnO** | 0.23 | 0.19 | 0.16 | 0.12 | 0.19 | 0.24 | 0.15 | 0.16 | 0.15 | 0.08 |
| **FeOt** | 6.23 | 6.55 | 6.45 | 6.33 | 6.58 | 6.45 | 6.24 | 6.41 | 6.38 | 6.30 |
| **Total** | 97.99 | 97.43 | 98.36 | 97.90 | 97.45 | 98.16 | 96.90 | 97.77 | 98.03 | 97.39 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | AT6.4.3 | AT6.5.1 | AT6.5.2 | AT6.5.3 | AT6.6.1 | AT6.6.3 | AT6.7.1 | AT6.7.2 | AT6.8.1 | AT6.8.2 |
| **Na2O** | 4.63 | 4.70 | 4.54 | 4.71 | 4.70 | 4.60 | 4.34 | 4.24 | 4.57 | 4.43 |
| **MgO** | 1.89 | 1.96 | 2.02 | 1.97 | 1.78 | 1.78 | 2.39 | 2.69 | 1.92 | 2.11 |
| **Al2O3** | 17.54 | 17.44 | 17.46 | 17.45 | 17.78 | 17.64 | 17.34 | 17.43 | 17.45 | 17.52 |
| **SiO2** | 54.81 | 54.29 | 53.98 | 54.41 | 55.45 | 54.82 | 54.03 | 54.11 | 54.63 | 54.33 |
| **P2O5** | 0.60 | 0.58 | 0.60 | 0.63 | 0.64 | 0.55 | 0.58 | 0.62 | 0.58 | 0.58 |
| **ClO2** | 0.28 | 0.33 | 0.33 | 0.30 | 0.34 | 0.38 | 0.31 | 0.34 | 0.31 | 0.34 |
| **K2O** | 6.75 | 6.51 | 6.64 | 6.70 | 6.76 | 6.62 | 6.49 | 5.81 | 6.68 | 6.39 |
| **CaO** | 4.14 | 4.32 | 4.49 | 4.37 | 4.05 | 3.91 | 4.78 | 5.33 | 4.27 | 4.44 |
| **TiO2** | 0.67 | 0.64 | 0.63 | 0.62 | 0.60 | 0.57 | 0.69 | 0.63 | 0.60 | 0.60 |
| **MnO** | 0.13 | 0.19 | 0.17 | 0.05 | 0.19 | 0.13 | 0.12 | 0.19 | 0.09 | 0.14 |
| **FeOt** | 6.27 | 6.49 | 6.65 | 6.30 | 6.30 | 6.52 | 6.61 | 7.00 | 6.36 | 6.48 |
| **Total** | 97.71 | 97.44 | 97.52 | 97.51 | 98.59 | 97.51 | 97.68 | 98.38 | 97.46 | 97.35 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.10.20 | 10.10.20 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | AT6.9.1 | AT6.9.2 | GAT5.1.1 | GAT5.1.2 | GAT5.1.3 | GAT5.10.1 | GAT5.10.2 | GAT5.10.3 | GAT5.11.1 | GAT5.11.2 |
| **Na2O** | 4.90 | 4.65 | 4.83 | 4.80 | 4.60 | 4.77 | 4.64 | 4.78 | 4.49 | 4.45 |
| **MgO** | 1.83 | 1.78 | 1.96 | 2.04 | 2.04 | 2.04 | 2.04 | 2.04 | 2.27 | 2.24 |
| **Al2O3** | 17.47 | 17.57 | 17.98 | 17.46 | 17.91 | 17.41 | 17.56 | 17.42 | 17.28 | 17.49 |
| **SiO2** | 55.03 | 54.88 | 55.06 | 54.10 | 54.64 | 54.87 | 54.69 | 53.91 | 54.42 | 54.64 |
| **P2O5** | 0.56 | 0.58 | 0.59 | 0.63 | 0.62 | 0.59 | 0.53 | 0.61 | 0.56 | 0.50 |
| **ClO2** | 0.33 | 0.33 | 0.43 | 0.35 | 0.33 | 0.31 | 0.34 | 0.32 | 0.34 | 0.33 |
| **K2O** | 6.72 | 6.75 | 6.68 | 6.54 | 6.71 | 6.62 | 6.61 | 6.63 | 6.61 | 6.65 |
| **CaO** | 3.94 | 3.94 | 4.39 | 4.68 | 4.66 | 4.60 | 4.67 | 4.74 | 4.97 | 4.85 |
| **TiO2** | 0.61 | 0.62 | 0.62 | 0.61 | 0.66 | 0.62 | 0.67 | 0.65 | 0.67 | 0.65 |
| **MnO** | 0.15 | 0.06 | 0.18 | 0.15 | 0.20 | 0.15 | 0.07 | 0.12 | 0.22 | 0.16 |
| **FeOt** | 6.75 | 6.40 | 6.48 | 7.17 | 6.72 | 6.82 | 6.74 | 6.91 | 6.81 | 7.17 |
| **Total** | 98.29 | 97.55 | 99.20 | 98.56 | 99.09 | 98.78 | 98.57 | 98.13 | 98.62 | 99.13 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | GAT5.11.3 | GAT5.12.1 | GAT5.12.2 | GAT5.12.3 | GAT5.13.1 | GAT5.13.2 | GAT5.13.3 | GAT5.14.1 | GAT5.14.2 | GAT5.14.3 |
| **Na2O** | 4.57 | 4.53 | 4.84 | 4.64 | 4.35 | 4.20 | 4.83 | 4.56 | 4.59 | 4.84 |
| **MgO** | 2.12 | 2.03 | 2.08 | 2.07 | 2.74 | 2.30 | 2.41 | 2.00 | 2.10 | 2.17 |
| **Al2O3** | 17.70 | 17.79 | 17.59 | 17.75 | 16.74 | 17.22 | 16.68 | 17.74 | 17.68 | 17.55 |
| **SiO2** | 54.60 | 54.84 | 55.20 | 54.67 | 53.32 | 54.16 | 53.35 | 54.60 | 54.44 | 54.86 |
| **P2O5** | 0.63 | 0.55 | 0.59 | 0.62 | 0.64 | 0.57 | 0.53 | 0.59 | 0.59 | 0.63 |
| **ClO2** | 0.31 | 0.30 | 0.32 | 0.31 | 0.33 | 0.28 | 0.66 | 0.32 | 0.31 | 0.32 |
| **K2O** | 6.75 | 6.77 | 6.50 | 6.52 | 6.26 | 6.62 | 6.38 | 6.62 | 6.66 | 6.60 |
| **CaO** | 4.80 | 4.62 | 4.67 | 4.74 | 5.63 | 5.00 | 5.31 | 4.76 | 4.75 | 4.76 |
| **TiO2** | 0.65 | 0.61 | 0.63 | 0.59 | 0.69 | 0.62 | 0.68 | 0.62 | 0.58 | 0.68 |
| **MnO** | 0.20 | 0.20 | 0.10 | 0.11 | 0.14 | 0.14 | 0.25 | 0.14 | 0.15 | 0.20 |
| **FeOt** | 6.95 | 6.93 | 6.88 | 7.01 | 7.34 | 6.85 | 7.35 | 6.97 | 6.89 | 6.60 |
| **Total** | 99.27 | 99.17 | 99.40 | 99.03 | 98.19 | 97.97 | 98.44 | 98.90 | 98.73 | 99.21 |
| **Date Analysed** | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | GAT5.15.1 | GAT5.15.2 | GAT5.15.3 | GAT5.2.1 | GAT5.2.2 | GAT5.2.3 | GAT5.3.1 | GAT5.3.2 | GAT5.3.3 | GAT5.4.1 |
| **Na2O** | 4.76 | 4.93 | 4.51 | 4.70 | 4.45 | 4.35 | 4.88 | 4.53 | 4.51 | 4.47 |
| **MgO** | 2.18 | 2.33 | 2.13 | 2.04 | 2.13 | 2.25 | 2.14 | 2.10 | 2.22 | 2.20 |
| **Al2O3** | 17.43 | 17.20 | 17.53 | 17.48 | 17.66 | 17.82 | 17.40 | 17.42 | 17.53 | 17.09 |
| **SiO2** | 54.17 | 52.90 | 54.66 | 55.05 | 54.69 | 54.27 | 54.19 | 54.75 | 54.35 | 54.10 |
| **P2O5** | 0.62 | 0.63 | 0.55 | 0.65 | 0.59 | 0.67 | 0.63 | 0.57 | 0.57 | 0.63 |
| **ClO2** | 0.43 | 0.31 | 0.35 | 0.31 | 0.30 | 0.35 | 0.31 | 0.29 | 0.32 | 0.33 |
| **K2O** | 6.51 | 6.36 | 6.57 | 6.73 | 6.47 | 6.41 | 6.73 | 6.66 | 6.59 | 6.53 |
| **CaO** | 4.85 | 4.66 | 4.72 | 4.52 | 4.86 | 5.02 | 4.67 | 4.84 | 4.92 | 4.96 |
| **TiO2** | 0.64 | 0.63 | 0.66 | 0.66 | 0.67 | 0.65 | 0.63 | 0.59 | 0.70 | 0.68 |
| **MnO** | 0.23 | 0.18 | 0.16 | 0.11 | 0.17 | 0.13 | 0.24 | 0.21 | 0.10 | 0.28 |
| **FeOt** | 6.92 | 6.59 | 6.78 | 7.09 | 6.78 | 7.02 | 6.73 | 6.94 | 6.84 | 7.02 |
| **Total** | 98.75 | 96.72 | 98.62 | 99.35 | 98.77 | 98.94 | 98.54 | 98.90 | 98.65 | 98.28 |
| **Date Analysed** | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | GAT5.4.2 | GAT5.4.3 | GAT5.5.1 | GAT5.5.2 | GAT5.5.3 | GAT5.6.1 | GAT5.6.2 | GAT5.6.3 | GAT5.7.1 | GAT5.7.2 |
| **Na2O** | 4.68 | 4.50 | 4.69 | 4.70 | 4.71 | 4.82 | 4.73 | 4.70 | 4.55 | 4.66 |
| **MgO** | 2.13 | 2.16 | 1.81 | 1.81 | 1.85 | 2.36 | 1.83 | 1.91 | 2.21 | 2.20 |
| **Al2O3** | 17.53 | 17.59 | 17.59 | 17.49 | 17.48 | 17.60 | 17.90 | 17.68 | 17.58 | 17.71 |
| **SiO2** | 53.95 | 54.40 | 55.23 | 55.47 | 54.91 | 53.62 | 55.29 | 54.96 | 54.37 | 54.45 |
| **P2O5** | 0.62 | 0.62 | 0.60 | 0.60 | 0.57 | 0.61 | 0.58 | 0.59 | 0.62 | 0.58 |
| **ClO2** | 0.33 | 0.34 | 0.33 | 0.34 | 0.33 | 0.36 | 0.33 | 0.30 | 0.31 | 0.33 |
| **K2O** | 6.53 | 6.58 | 6.92 | 6.78 | 6.91 | 6.47 | 6.97 | 6.87 | 6.40 | 6.42 |
| **CaO** | 5.02 | 4.84 | 4.07 | 4.04 | 4.21 | 4.53 | 4.14 | 4.20 | 5.01 | 4.94 |
| **TiO2** | 0.67 | 0.65 | 0.56 | 0.70 | 0.59 | 0.63 | 0.67 | 0.60 | 0.64 | 0.60 |
| **MnO** | 0.15 | 0.14 | 0.14 | 0.02 | 0.09 | 0.20 | 0.08 | 0.16 | 0.20 | 0.13 |
| **FeOt** | 7.10 | 6.90 | 6.89 | 6.73 | 6.32 | 7.29 | 6.49 | 7.28 | 6.73 | 7.01 |
| **Total** | 98.70 | 98.71 | 98.82 | 98.69 | 97.97 | 98.51 | 99.01 | 99.25 | 98.62 | 99.03 |
| **Date Analysed** | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | GAT5.7.3 | GAT5.8.1 | GAT5.8.2 | GAT5.8.3 | GAT5.9.1 | GAT5.9.2 | AT7.1.1 | AT7.1.2 | AT7.1.3 | AT7.10.1 |
| **Na2O** | 4.52 | 4.59 | 4.78 | 4.46 | 5.36 | 5.14 | 4.35 | 4.30 | 4.22 | 4.31 |
| **MgO** | 2.26 | 2.05 | 2.02 | 2.04 | 1.56 | 1.52 | 2.74 | 2.53 | 2.67 | 2.67 |
| **Al2O3** | 17.61 | 17.66 | 17.31 | 17.76 | 18.21 | 17.72 | 16.75 | 17.00 | 17.37 | 16.88 |
| **SiO2** | 54.68 | 54.94 | 54.58 | 54.90 | 55.67 | 54.97 | 52.97 | 52.53 | 53.12 | 53.42 |
| **P2O5** | 0.66 | 0.58 | 0.61 | 0.63 | 0.59 | 0.68 | 0.59 | 0.58 | 0.54 | 0.57 |
| **ClO2** | 0.29 | 0.33 | 0.34 | 0.28 | 0.31 | 0.33 | 0.29 | 0.26 | 0.31 | 0.28 |
| **K2O** | 6.56 | 6.65 | 6.47 | 6.65 | 6.61 | 6.52 | 5.88 | 6.46 | 6.31 | 6.24 |
| **CaO** | 5.08 | 4.60 | 4.57 | 4.57 | 3.76 | 3.77 | 5.48 | 5.28 | 5.52 | 5.40 |
| **TiO2** | 0.66 | 0.63 | 0.63 | 0.58 | 0.61 | 0.62 | 0.62 | 0.64 | 0.63 | 0.64 |
| **MnO** | 0.12 | 0.08 | 0.15 | 0.20 | 0.06 | 0.16 | 0.11 | 0.17 | 0.17 | 0.05 |
| **FeOt** | 7.03 | 6.93 | 6.87 | 6.23 | 6.82 | 6.65 | 7.30 | 7.46 | 7.14 | 7.02 |
| **Total** | 99.47 | 99.04 | 98.32 | 98.29 | 99.56 | 98.07 | 97.09 | 97.20 | 98.00 | 97.48 |

| Date Analysed | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| Label | AT7.10.2 | AT7.10.3 | AT7.13.1 | AT7.14.1 | AT7.14.2 | AT7.14.3 | AT7.15.2 | AT7.2.1 | AT7.2.2 | AT7.2.3 |
| Na2O | 4.44 | 3.92 | 3.57 | 4.44 | 4.40 | 4.24 | 4.54 | 4.35 | 4.56 | 4.65 |
| MgO | 2.73 | 2.62 | 2.53 | 2.60 | 2.64 | 2.60 | 2.63 | 2.68 | 2.75 | 2.67 |
| Al2O3 | 16.98 | 17.36 | 16.93 | 16.89 | 17.04 | 17.33 | 17.26 | 16.87 | 17.21 | 17.13 |
| SiO2 | 52.87 | 53.08 | 51.62 | 53.58 | 53.23 | 53.72 | 52.92 | 52.42 | 53.31 | 53.55 |
| P2O5 | 0.55 | 0.52 | 0.48 | 0.54 | 0.52 | 0.54 | 0.54 | 0.60 | 0.58 | 0.59 |
| ClO2 | 0.29 | 0.32 | 0.21 | 0.31 | 0.29 | 0.29 | 0.31 | 0.26 | 0.29 | 0.28 |
| K2O | 6.05 | 6.32 | 8.08 | 6.19 | 6.03 | 6.24 | 5.84 | 6.19 | 6.28 | 6.09 |
| CaO | 5.39 | 5.63 | 5.11 | 5.31 | 5.40 | 5.47 | 5.68 | 5.46 | 5.40 | 5.49 |
| TiO2 | 0.61 | 0.66 | 0.59 | 0.63 | 0.65 | 0.59 | 0.64 | 0.64 | 0.69 | 0.63 |
| MnO | 0.16 | 0.19 | 0.06 | 0.13 | 0.14 | 0.21 | 0.22 | 0.18 | 0.11 | 0.10 |
| FeOt | 7.14 | 7.13 | 7.12 | 7.32 | 7.18 | 6.74 | 6.61 | 7.31 | 7.17 | 6.87 |
| Total | 97.22 | 97.74 | 96.30 | 97.94 | 97.53 | 97.99 | 97.18 | 96.95 | 98.34 | 98.06 |
| Date Analysed | 10.10.20 | 10.10.20 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
| Eruptive Unit | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| Label | AT7.3.1 | AT7.3.2 | GAT4.1.g1 | GAT4.1.g2 | GAT4.1.g3 | GAT4.1.g4 | GAT4.1.g5 | GAT4.10.g1 | GAT4.10.g2 | GAT4.10.g3 |
| Na2O | 4.45 | 4.47 | 3.91 | 4.33 | 3.98 | 3.92 | 4.18 | 3.98 | 4.34 | 4.03 |
| MgO | 2.46 | 2.32 | 2.60 | 2.51 | 2.70 | 2.58 | 2.67 | 2.75 | 2.72 | 2.60 |
| Al2O3 | 17.51 | 17.42 | 17.36 | 17.37 | 17.49 | 17.43 | 17.26 | 17.27 | 17.61 | 17.06 |
| SiO2 | 53.60 | 53.43 | 54.19 | 53.71 | 55.14 | 54.82 | 54.10 | 54.21 | 54.59 | 53.22 |
| P2O5 | 0.58 | 0.58 | 0.62 | 0.60 | 0.58 | 0.58 | 0.60 | 0.61 | 0.55 | 0.61 |
| ClO2 | 0.31 | 0.34 | 0.31 | 0.29 | 0.31 | 0.29 | 0.29 | 0.30 | 0.29 | 0.28 |
| K2O | 6.34 | 6.21 | 6.80 | 6.54 | 6.84 | 6.72 | 7.01 | 6.78 | 6.74 | 6.59 |
| CaO | 5.09 | 5.06 | 5.48 | 5.26 | 5.48 | 5.59 | 5.33 | 5.55 | 5.54 | 5.56 |
| TiO2 | 0.55 | 0.59 | 0.71 | 0.66 | 0.68 | 0.66 | 0.65 | 0.68 | 0.69 | 0.71 |
| MnO | 0.17 | 0.12 | 0.15 | 0.10 | 0.09 | 0.14 | 0.13 | 0.14 | 0.08 | 0.13 |
| FeOt | 6.88 | 7.12 | 6.77 | 6.88 | 7.42 | 6.66 | 6.83 | 7.26 | 6.67 | 7.07 |
| Total | 97.95 | 97.65 | 98.89 | 98.25 | 100.72 | 99.39 | 99.05 | 99.53 | 99.82 | 97.85 |
| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
| Eruptive Unit | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| Label | GAT4.10.g4 | GAT4.11.g1 | GAT4.11.g2 | GAT4.11.g3 | GAT4.12.g1 | GAT4.12.g2 | GAT4.12.g3 | GAT4.12.g4 | GAT4.13.g1 | GAT4.13.g2 |
| Na2O | 4.17 | 4.05 | 4.19 | 3.91 | 3.21 | 3.41 | 3.73 | 3.65 | 3.91 | 4.06 |
| MgO | 2.67 | 2.64 | 2.61 | 2.70 | 2.60 | 2.66 | 2.62 | 2.50 | 2.59 | 2.63 |
| Al2O3 | 17.20 | 17.52 | 17.62 | 17.63 | 17.39 | 17.77 | 17.54 | 17.05 | 17.60 | 17.60 |
| SiO2 | 53.98 | 53.79 | 53.90 | 54.32 | 53.89 | 54.62 | 54.07 | 52.32 | 54.02 | 54.27 |
| P2O5 | 0.58 | 0.55 | 0.62 | 0.61 | 0.60 | 0.63 | 0.62 | 0.57 | 0.58 | 0.60 |
| ClO2 | 0.27 | 0.30 | 0.30 | 0.33 | 0.30 | 0.32 | 0.31 | 0.33 | 0.32 | 0.28 |
| K2O | 6.61 | 6.63 | 6.63 | 6.52 | 7.08 | 6.69 | 6.92 | 6.77 | 7.15 | 6.71 |
| CaO | 5.64 | 5.38 | 5.52 | 5.62 | 5.51 | 5.70 | 5.42 | 5.23 | 5.41 | 5.54 |
| TiO2 | 0.63 | 0.63 | 0.62 | 0.67 | 0.67 | 0.71 | 0.64 | 0.58 | 0.63 | 0.67 |
| MnO | 0.16 | 0.20 | 0.22 | 0.12 | 0.25 | 0.11 | 0.15 | 0.02 | 0.20 | 0.08 |
| FeOt | 7.01 | 7.48 | 7.18 | 7.54 | 6.68 | 6.90 | 7.03 | 6.50 | 7.28 | 7.20 |
| Total | 98.92 | 99.16 | 99.42 | 99.97 | 98.17 | 99.53 | 99.04 | 95.53 | 99.69 | 99.64 |
| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
| Eruptive Unit | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| Label | GAT4.13.g3 | GAT4.13.g4 | GAT4.14.g1 | GAT4.14.g2 | GAT4.14.g3 | GAT4.15.g1 | GAT4.15.g2 | GAT4.15.g3 | GAT4.15.g4 | GAT4.15.g5 |
| Na2O | 3.95 | 3.90 | 3.65 | 3.98 | 3.98 | 4.09 | 3.93 | 3.66 | 3.70 | 4.21 |
| MgO | 2.67 | 2.56 | 2.61 | 2.49 | 2.64 | 2.48 | 2.62 | 2.69 | 2.65 | 2.52 |
| Al2O3 | 17.41 | 17.58 | 17.86 | 17.58 | 17.31 | 17.21 | 17.42 | 17.57 | 17.62 | 17.66 |
| SiO2 | 53.87 | 54.16 | 54.89 | 54.60 | 52.70 | 53.17 | 53.96 | 54.12 | 54.49 | 53.92 |
| P2O5 | 0.58 | 0.56 | 0.59 | 0.59 | 0.60 | 0.59 | 0.58 | 0.56 | 0.58 | 0.62 |
| ClO2 | 0.34 | 0.31 | 0.30 | 0.28 | 0.29 | 0.31 | 0.36 | 0.31 | 0.28 | 0.29 |
| K2O | 6.83 | 6.95 | 7.14 | 7.03 | 6.88 | 6.77 | 6.59 | 6.99 | 6.83 | 6.74 |
| CaO | 5.49 | 5.58 | 5.54 | 5.30 | 5.56 | 5.37 | 5.55 | 5.51 | 5.58 | 5.46 |
| TiO2 | 0.73 | 0.67 | 0.67 | 0.64 | 0.67 | 0.60 | 0.68 | 0.63 | 0.71 | 0.62 |
| MnO | 0.11 | 0.08 | 0.03 | 0.19 | 0.12 | 0.24 | 0.22 | 0.16 | 0.15 | 0.07 |
| FeOt | 7.11 | 6.38 | 7.08 | 6.89 | 7.23 | 7.02 | 6.87 | 7.27 | 7.13 | 7.16 |
| Total | 99.09 | 98.74 | 100.37 | 99.57 | 97.98 | 97.84 | 98.77 | 99.46 | 99.71 | 99.28 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | GAT4.2.g1 | GAT4.2.g2 | GAT4.2.g3 | GAT4.2.g4 | GAT4.2.g5 | GAT4.3.g1 | GAT4.3.g2 | GAT4.3.g3 | GAT4.3.g4 | GAT4.4.g1 |
| **Na2O** | 3.84 | 2.81 | 3.88 | 4.35 | 4.32 | 4.01 | 4.27 | 4.26 | 4.32 | 3.78 |
| **MgO** | 2.51 | 2.62 | 2.56 | 2.36 | 2.37 | 2.68 | 2.62 | 2.48 | 2.53 | 2.57 |
| **Al2O3** | 17.27 | 17.58 | 17.33 | 17.44 | 17.39 | 17.37 | 17.45 | 17.49 | 17.77 | 17.59 |
| **SiO2** | 54.07 | 54.18 | 54.07 | 54.38 | 53.49 | 53.68 | 54.10 | 53.95 | 54.21 | 53.57 |
| **P2O5** | 0.59 | 0.56 | 0.60 | 0.63 | 0.57 | 0.59 | 0.59 | 0.59 | 0.55 | 0.59 |
| **ClO2** | 0.32 | 0.32 | 0.33 | 0.23 | 0.23 | 0.32 | 0.27 | 0.28 | 0.24 | 0.28 |
| **K2O** | 7.14 | 6.69 | 6.94 | 7.23 | 7.14 | 6.74 | 6.68 | 6.50 | 6.96 | 6.65 |
| **CaO** | 5.40 | 5.60 | 5.44 | 5.17 | 5.22 | 5.55 | 5.61 | 5.37 | 5.19 | 5.49 |
| **TiO2** | 0.66 | 0.67 | 0.66 | 0.63 | 0.66 | 0.65 | 0.72 | 0.64 | 0.58 | 0.70 |
| **MnO** | 0.18 | 0.21 | 0.14 | 0.11 | 0.12 | 0.10 | 0.15 | 0.08 | 0.21 | 0.12 |
| **FeOt** | 7.16 | 7.40 | 6.97 | 7.11 | 7.82 | 7.53 | 7.03 | 7.12 | 6.72 | 7.12 |
| **Total** | 99.15 | 98.63 | 98.92 | 99.66 | 99.33 | 99.22 | 99.50 | 98.75 | 99.27 | 98.47 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | GAT4.4.g2 | GAT4.4.g3 | GAT4.4.g4 | GAT4.4.g5 | GAT4.5.g1 | GAT4.5.g2 | GAT4.5.g3 | GAT4.5.g4 | GAT4.5.g5 | GAT4.6.g1 |
| **Na2O** | 4.25 | 4.17 | 4.47 | 4.36 | 4.15 | 4.18 | 3.98 | 4.22 | 4.40 | 3.87 |
| **MgO** | 2.62 | 2.74 | 2.62 | 2.58 | 2.56 | 2.67 | 2.68 | 2.64 | 2.35 | 2.63 |
| **Al2O3** | 17.54 | 17.69 | 17.55 | 17.56 | 17.28 | 17.37 | 17.50 | 17.55 | 17.57 | 17.34 |
| **SiO2** | 54.20 | 53.91 | 53.87 | 53.87 | 53.88 | 54.47 | 54.10 | 54.00 | 54.18 | 53.86 |
| **P2O5** | 0.55 | 0.62 | 0.59 | 0.57 | 0.62 | 0.58 | 0.59 | 0.58 | 0.59 | 0.61 |
| **ClO2** | 0.32 | 0.31 | 0.27 | 0.30 | 0.29 | 0.31 | 0.28 | 0.29 | 0.26 | 0.32 |
| **K2O** | 6.82 | 6.87 | 7.20 | 6.68 | 6.65 | 6.84 | 6.77 | 7.21 | 7.14 | 6.99 |
| **CaO** | 5.53 | 5.62 | 5.32 | 5.51 | 5.49 | 5.65 | 5.34 | 5.08 | 4.99 | 5.58 |
| **TiO2** | 0.71 | 0.70 | 0.64 | 0.68 | 0.65 | 0.69 | 0.58 | 0.69 | 0.61 | 0.69 |
| **MnO** | 0.20 | 0.18 | 0.23 | 0.10 | 0.29 | 0.12 | 0.10 | 0.13 | 0.24 | 0.26 |
| **FeOt** | 6.96 | 7.06 | 7.17 | 6.95 | 7.03 | 7.19 | 6.86 | 6.97 | 6.17 | 7.26 |
| **Total** | 99.69 | 99.85 | 99.92 | 99.15 | 98.91 | 100.06 | 98.78 | 99.34 | 98.51 | 99.40 |

| Date Analysed | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 | Vulcanello 1 |
| **Label** | GAT4.6.g5 | GAT4.7.g1 | GAT4.7.g2 | GAT4.7.g3 | GAT4.8.g2 | GAT4.8.g3 | GAT4.8.g4 | GAT4.9.g1 | GAT4.9.g2 | GAT4.9.g3 |
| **Na2O** | 4.47 | 4.22 | 4.04 | 4.14 | 4.09 | 4.07 | 4.03 | 4.25 | 4.48 | 4.15 |
| **MgO** | 2.38 | 2.72 | 2.67 | 2.68 | 2.70 | 2.57 | 2.55 | 2.57 | 2.67 | 2.62 |
| **Al2O3** | 17.77 | 17.56 | 17.41 | 17.39 | 17.68 | 17.58 | 17.51 | 17.59 | 17.43 | 17.61 |
| **SiO2** | 53.75 | 54.29 | 53.96 | 54.16 | 54.18 | 54.16 | 54.67 | 54.13 | 53.87 | 54.29 |
| **P2O5** | 0.68 | 0.62 | 0.57 | 0.57 | 0.61 | 0.64 | 0.61 | 0.53 | 0.60 | 0.60 |
| **ClO2** | 0.32 | 0.27 | 0.29 | 0.28 | 0.30 | 0.32 | 0.29 | 0.29 | 0.28 | 0.29 |
| **K2O** | 6.75 | 6.65 | 6.64 | 6.74 | 6.53 | 6.94 | 6.89 | 6.59 | 6.41 | 6.68 |
| **CaO** | 5.31 | 5.73 | 5.56 | 5.69 | 5.46 | 5.47 | 5.34 | 5.40 | 5.58 | 5.64 |
| **TiO2** | 0.69 | 0.67 | 0.64 | 0.61 | 0.69 | 0.68 | 0.69 | 0.60 | 0.63 | 0.68 |
| **MnO** | 0.17 | 0.10 | 0.15 | 0.10 | 0.13 | 0.15 | 0.10 | 0.27 | 0.06 | 0.19 |
| **FeOt** | 7.24 | 7.20 | 7.36 | 7.55 | 7.28 | 7.24 | 6.96 | 7.36 | 8.42 | 6.97 |
| **Total** | 99.52 | 100.03 | 99.28 | 99.90 | 99.65 | 99.80 | 99.64 | 99.58 | 100.43 | 99.71 |

Table D2: Complete list of data produced through EMPA at Oxford for glass samples collected from Vulcanello.

| Analysed By | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato |
| **Label** | LPilato_2a_1 | LPilato_10b_1 | LPilato_8b_1 | LPilato_13c_3 | LPilato_2a_2 | LPilato_15c_3 | LPilato_5a_1 | LPilato_6b_1 | LPilato_12c_1 | LPilato_1a_2 |
| **Na2O** | 3.96 | 4.07 | 4.12 | 3.82 | 3.67 | 3.95 | 3.84 | 3.83 | 4.13 | 4.13 |
| **MgO** | 0.03 | 0.03 | 0.05 | 0.03 | 0.00 | 0.04 | 0.00 | 0.01 | 0.04 | 0.05 |
| **Al2O3** | 12.35 | 12.32 | 12.54 | 12.51 | 12.79 | 12.58 | 13.29 | 12.46 | 12.56 | 12.27 |
| **SiO2** | 74.00 | 73.94 | 72.88 | 73.43 | 73.19 | 72.80 | 72.39 | 73.27 | 72.66 | 73.01 |
| **K2O** | 4.77 | 4.88 | 4.91 | 4.86 | 4.96 | 4.97 | 4.94 | 4.88 | 4.99 | 5.01 |
| **CaO** | 0.66 | 0.62 | 0.73 | 0.72 | 0.73 | 0.67 | 0.74 | 0.74 | 0.69 | 0.66 |
| **TiO2** | 0.04 | 0.06 | 0.11 | 0.06 | 0.04 | 0.10 | 0.07 | 0.09 | 0.08 | 0.08 |
| **MnO** | 0.09 | 0.00 | 0.12 | 0.01 | 0.11 | 0.06 | 0.05 | 0.05 | 0.08 | 0.07 |
| **FeOt** | 1.56 | 1.38 | 1.49 | 1.36 | 1.22 | 1.52 | 1.34 | 1.30 | 1.37 | 1.33 |
| **Total** | 97.48 | 97.30 | 96.94 | 96.78 | 96.71 | 96.69 | 96.65 | 96.63 | 96.61 | 96.61 |

| Analysed By | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato |
| **Label** | LPilato_8b_2 | LPilato_15c_2 | LPilato_4a_1 | LPilato_7b_1 | LPilato_1a_1 | LPilato_4a_2 | LPilato_14c_1 | LPilato_12c_2 | LPilato_3a_1 | LPilato_3a_2 |
| **Na2O** | 4.10 | 3.87 | 3.80 | 4.00 | 3.78 | 3.79 | 3.63 | 3.99 | 3.84 | 3.79 |
| **MgO** | 0.03 | 0.01 | 0.02 | 0.05 | 0.02 | 0.03 | 0.04 | 0.05 | 0.02 | 0.03 |
| **Al2O3** | 12.23 | 12.62 | 12.16 | 12.48 | 12.74 | 12.29 | 12.02 | 12.46 | 12.10 | 12.15 |
| **SiO2** | 73.15 | 72.95 | 73.26 | 72.60 | 72.31 | 72.91 | 73.01 | 72.32 | 72.01 | 73.03 |
| **K2O** | 4.89 | 4.72 | 4.90 | 4.76 | 4.99 | 4.74 | 4.96 | 4.97 | 4.80 | 4.82 |
| **CaO** | 0.76 | 0.73 | 0.73 | 0.72 | 0.69 | 0.68 | 0.73 | 0.64 | 0.66 | 0.61 |
| **TiO2** | 0.05 | 0.09 | 0.05 | 0.07 | 0.09 | 0.13 | 0.10 | 0.11 | 0.06 | 0.04 |
| **MnO** | 0.09 | 0.06 | 0.06 | 0.11 | 0.08 | 0.09 | 0.03 | 0.12 | 0.02 | 0.10 |
| **FeOt** | 1.30 | 1.46 | 1.32 | 1.49 | 1.45 | 1.46 | 1.52 | 1.32 | 1.28 | 1.38 |
| **Total** | 96.58 | 96.51 | 96.32 | 96.26 | 96.14 | 96.12 | 96.04 | 95.98 | 94.78 | 95.94 |

| Analysed By | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert | P. Albert |
|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato | Monte Pilato |
| **Label** | LPilato_9b_1 | LPilato_6b_2 | LPilato_10b_2 | LPilato_5a_2 | LPilato_9b_2 | LPilato_11c_2 | LPilato_11c_1 | LPilato_13c_1 |
| **Na2O** | 4.12 | 3.71 | 3.75 | 3.77 | 3.58 | 3.64 | 3.35 | 3.52 |
| **MgO** | 0.01 | 0.01 | 0.02 | 0.01 | 0.03 | 0.04 | 0.02 | 0.04 |
| **Al2O3** | 11.86 | 12.53 | 12.33 | 12.68 | 11.75 | 11.92 | 13.72 | 12.17 |
| **SiO2** | 73.10 | 72.56 | 72.09 | 71.71 | 70.90 | 72.51 | 69.48 | 71.85 |
| **K2O** | 4.66 | 4.74 | 4.86 | 4.76 | 4.83 | 4.79 | 4.79 | 4.80 |
| **CaO** | 0.66 | 0.68 | 0.74 | 0.63 | 0.75 | 0.70 | 0.72 | 0.69 |
| **TiO2** | 0.03 | 0.09 | 0.11 | 0.04 | 0.07 | 0.05 | 0.08 | 0.07 |
| **MnO** | 0.02 | 0.04 | 0.02 | 0.05 | 0.03 | 0.05 | 0.04 | 0.06 |
| **FeOt** | 1.42 | 1.29 | 1.43 | 1.46 | 1.29 | 1.34 | 1.58 | 1.30 |
| **Total** | 95.89 | 95.66 | 95.34 | 95.12 | 93.22 | 95.05 | 93.78 | 94.51 |

Table D3: Complete list of data produced through EMPA at Oxford for glass samples collected from Lipari.

EMPA Secondary Standard Data

A selection of secondary standards are analysed during each run in order to help identify any systematic errors which may occur during the run, such as instrumental instability due to the atmospheric pressure or any background interference on the peaks. However, there are several random errors that it is not possible to correct for such as the random nature of x-ray generation or the exact thickness of the carbon coating on the stubs. Other random errors that it may be possible to try to minimize are operator inconsistency (by always making sure that the beam is perfectly focussed) and by properly cleaning the stubs with ethanol before coating them so there is no grease present. By comparing the secondary standards to their USGS certified value, it is possible to get a good indicator of the error.

Table D.4 (over the next 6 pages) gives details of all the secondary standards (atho, gor-128, gor-132 and sths 6/80) run during the EMP analysis of the glasses from La Fossa, Vulcanello and Lipari. The final part of the table shows the average and standard deviation values for all the analyses run along with a comparison of them to the USGS certified values for each secondary standard.

| Date | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Label | atho_1 | atho_10 | atho_11 | atho_2 | atho_3 | atho_4 | atho_5 | atho_6 | atho_7 | atho_8 | atho_9 | atho_1 | atho_10 | atho_11 | atho_12 | atho_13 | atho_14 | atho_15 |
| Ox% (Na) | 4.04 | 4.23 | 3.99 | 4.26 | 4.01 | 3.93 | 4.00 | 4.06 | 4.01 | 4.02 | 4.02 | 3.91 | 4.08 | 4.06 | 3.94 | 4.10 | 4.10 | 3.76 |
| Ox% (Mg) | 0.10 | 0.10 | 0.10 | 0.12 | 0.08 | 0.13 | 0.11 | 0.10 | 0.11 | 0.10 | 0.10 | 0.09 | 0.08 | 0.10 | 0.08 | 0.09 | 0.09 | 0.06 |
| Ox% (Al) | 12.33 | 12.31 | 12.31 | 12.28 | 12.53 | 12.17 | 12.52 | 12.30 | 12.31 | 12.25 | 12.51 | 12.27 | 12.01 | 12.22 | 12.05 | 12.24 | 12.33 | 12.19 |
| Ox% (Si) | 75.64 | 75.61 | 75.48 | 76.25 | 75.83 | 75.57 | 75.45 | 75.63 | 75.54 | 75.61 | 75.50 | 75.96 | 75.97 | 76.10 | 75.91 | 76.12 | 75.74 | 75.42 |
| Ox% (P) | 0.00 | 0.03 | 0.02 | 0.00 | 0.06 | 0.04 | 0.03 | 0.04 | 0.02 | 0.04 | 0.00 | 0.02 | 0.02 | 0.05 | 0.07 | 0.02 | 0.05 | 0.02 |
| Ox% (Cl) | 0.05 | 0.04 | 0.05 | 0.04 | 0.05 | 0.06 | 0.06 | 0.04 | 0.05 | 0.03 | 0.04 | 0.04 | 0.04 | 0.03 | 0.05 | 0.05 | 0.03 | 0.07 |
| Ox% (K) | 2.66 | 2.72 | 2.79 | 2.71 | 2.74 | 2.76 | 2.77 | 2.67 | 2.85 | 2.74 | 2.73 | 2.75 | 2.66 | 2.71 | 2.73 | 2.67 | 2.80 | 2.69 |
| Ox% (Ca) | 1.64 | 1.67 | 1.71 | 1.72 | 1.71 | 1.70 | 1.75 | 1.70 | 1.79 | 1.78 | 1.68 | 1.75 | 1.70 | 1.70 | 1.73 | 1.72 | 1.63 | 1.79 |
| Ox% (Ti) | 0.28 | 0.24 | 0.27 | 0.28 | 0.25 | 0.27 | 0.27 | 0.23 | 0.22 | 0.26 | 0.26 | 0.23 | 0.21 | 0.28 | 0.22 | 0.28 | 0.21 | 0.27 |
| Ox% (Mn) | 0.14 | 0.04 | 0.12 | 0.12 | 0.01 | 0.00 | 0.05 | 0.05 | 0.20 | 0.12 | 0.10 | 0.15 | 0.06 | 0.16 | 0.11 | 0.00 | 0.17 | 0.15 |
| Ox% (Fe) | 3.35 | 3.38 | 3.29 | 3.28 | 3.06 | 3.19 | 3.29 | 3.39 | 3.19 | 3.47 | 3.04 | 3.07 | 3.23 | 3.43 | 3.20 | 3.16 | 3.40 | 3.17 |
| Total | 100.24 | 100.37 | 100.13 | 101.05 | 100.32 | 99.83 | 100.30 | 100.20 | 100.28 | 100.43 | 99.98 | 100.24 | 100.06 | 100.84 | 100.09 | 100.45 | 100.55 | 99.59 |

| Date | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Label | atho_2 | atho_3 | atho_4 | atho_5 | atho_6 | atho_7 | atho_9 | atho_1 | atho_2 | atho_3 | atho_4 | atho_5 | atho_1 | atho_2 | atho_3 | atho_4 | atho_5 | atho_6 |
| Ox% (Na) | 3.86 | 3.83 | 4.04 | 4.36 | 4.11 | 4.12 | 4.14 | 3.87 | 4.20 | 4.14 | 4.04 | 4.30 | 3.90 | 3.95 | 4.06 | 4.06 | 3.78 | 3.90 |
| Ox% (Mg) | 0.11 | 0.07 | 0.10 | 0.10 | 0.09 | 0.10 | 0.05 | 0.09 | 0.09 | 0.10 | 0.10 | 0.08 | 0.10 | 0.09 | 0.10 | 0.10 | 0.08 | 0.11 |
| Ox% (Al) | 12.22 | 12.15 | 12.13 | 12.17 | 11.99 | 12.15 | 12.10 | 12.00 | 12.12 | 12.24 | 12.09 | 12.18 | 12.31 | 12.33 | 12.24 | 12.38 | 12.18 | 12.25 |
| Ox% (Si) | 75.70 | 75.18 | 75.70 | 75.70 | 75.42 | 75.17 | 75.52 | 75.11 | 75.57 | 75.04 | 75.43 | 74.85 | 75.19 | 75.21 | 74.80 | 75.40 | 74.98 | 74.37 |
| Ox% (P) | 0.02 | 0.06 | 0.01 | 0.02 | 0.02 | 0.03 | 0.00 | 0.00 | 0.03 | 0.01 | 0.00 | 0.01 | 0.03 | 0.02 | 0.03 | 0.00 | 0.00 | 0.03 |
| Ox% (Cl) | 0.02 | 0.05 | 0.05 | 0.06 | 0.05 | 0.04 | 0.05 | 0.06 | 0.03 | 0.05 | 0.05 | 0.08 | | | | | | |
| Ox% (K) | 2.67 | 2.76 | 2.75 | 2.74 | 2.72 | 2.71 | 2.75 | 2.66 | 2.59 | 2.62 | 2.72 | 2.65 | 2.75 | 2.70 | 2.72 | 2.71 | 2.62 | 2.76 |
| Ox% (Ca) | 1.67 | 1.71 | 1.71 | 1.61 | 1.71 | 1.70 | 1.68 | 1.71 | 1.73 | 1.72 | 1.65 | 1.82 | 1.63 | 1.68 | 1.67 | 1.68 | 1.65 | 1.66 |
| Ox% (Ti) | 0.26 | 0.24 | 0.22 | 0.22 | 0.22 | 0.29 | 0.24 | 0.27 | 0.26 | 0.26 | 0.22 | 0.29 | 0.27 | 0.24 | 0.26 | 0.30 | 0.26 | 0.23 |
| Ox% (Mn) | 0.09 | 0.11 | 0.18 | 0.09 | 0.04 | 0.04 | 0.14 | 0.02 | 0.15 | 0.13 | 0.11 | 0.15 | 0.16 | 0.12 | 0.11 | 0.04 | 0.19 | 0.15 |
| Ox% (Fe) | 3.21 | 3.17 | 3.13 | 3.18 | 3.30 | 3.42 | 3.48 | 3.47 | 3.48 | 3.26 | 3.19 | 3.45 | 3.43 | 3.32 | 3.22 | 3.37 | 3.27 | 3.34 |
| Total | 99.83 | 99.33 | 100.02 | 100.26 | 99.67 | 99.78 | 100.14 | 99.27 | 100.24 | 99.58 | 99.61 | 99.85 | 99.77 | 99.66 | 99.21 | 100.05 | 99.02 | 98.79 |

| Date | 10.08.31 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Label | atho_7 | atho_1 | atho_2 | atho_3 | atho_4 | atho_1 | atho_2 | atho_3 | atho_4 | atho_5 | atho_6 | atho_7 | atho_8 | g128_1 | g128_2 | g128_3 | g128_4 | g128_5 |
| Ox% (Na) | 4.08 | 4.18 | 3.89 | 3.98 | 4.07 | 4.10 | 4.05 | 4.04 | 4.22 | 4.08 | 4.19 | 4.00 | 4.31 | 0.44 | 0.64 | 0.50 | 0.70 | 0.51 |
| Ox% (Mg) | 0.11 | 0.09 | 0.05 | 0.11 | 0.09 | 0.14 | 0.10 | 0.09 | 0.10 | 0.10 | 0.09 | 0.10 | 0.10 | 25.71 | 27.01 | 26.33 | 26.09 | 26.48 |
| Ox% (Al) | 12.29 | 12.30 | 12.16 | 12.18 | 12.32 | 12.23 | 12.24 | 12.11 | 12.25 | 12.04 | 12.00 | 12.03 | 12.00 | 9.49 | 10.34 | 9.97 | 9.89 | 9.96 |
| Ox% (Si) | 74.75 | 75.32 | 75.22 | 75.42 | 74.86 | 75.41 | 75.21 | 75.21 | 75.22 | 74.94 | 74.81 | 74.98 | 75.48 | 46.53 | 46.63 | 46.42 | 46.51 | 46.69 |
| Ox% (P) | 0.02 | 0.01 | 0.04 | 0.01 | 0.02 | 0.02 | 0.00 | 0.04 | 0.03 | 0.05 | 0.04 | 0.04 | 0.02 | 0.01 | 0.04 | 0.02 | 0.04 | 0.06 |
| Ox% (Cl) | | 0.05 | 0.06 | 0.05 | 0.06 | 0.05 | 0.04 | 0.05 | 0.04 | 0.05 | 0.05 | 0.07 | 0.05 | 0.00 | 0.02 | 0.01 | 0.01 | 0.00 |
| Ox% (K) | 2.71 | 2.66 | 2.63 | 2.67 | 2.70 | 2.78 | 2.69 | 2.64 | 2.73 | 2.75 | 2.72 | 2.88 | 2.74 | 0.02 | 0.00 | 0.02 | 0.03 | 0.03 |
| Ox% (Ca) | 1.67 | 1.71 | 1.73 | 1.69 | 1.71 | 1.69 | 1.74 | 1.78 | 1.65 | 1.76 | 1.76 | 1.71 | 1.71 | 6.02 | 6.22 | 6.20 | 6.28 | 6.33 |
| Ox% (Ti) | 0.22 | 0.28 | 0.28 | 0.25 | 0.25 | 0.25 | 0.21 | 0.25 | 0.29 | 0.28 | 0.29 | 0.24 | 0.21 | 0.26 | 0.26 | 0.27 | 0.26 | 0.28 |
| Ox% (Mn) | 0.19 | 0.09 | 0.18 | 0.12 | 0.08 | 0.14 | 0.11 | 0.08 | 0.15 | 0.06 | 0.11 | 0.09 | 0.09 | 0.08 | 0.23 | 0.18 | 0.19 | 0.20 |
| Ox% (Fe) | 3.28 | 3.15 | 3.01 | 3.40 | 3.16 | 3.32 | 3.32 | 3.46 | 3.38 | 3.28 | 3.26 | 3.35 | 3.38 | 9.74 | 10.24 | 9.83 | 9.45 | 10.01 |
| Total | 99.34 | 99.84 | 99.25 | 99.88 | 99.31 | 100.12 | 99.71 | 99.76 | 100.07 | 99.40 | 99.31 | 99.52 | 100.09 | 98.30 | 101.61 | 99.74 | 99.45 | 100.55 |

| Date | 10.03.18 | 10.03.18 | 10.03.18 | 10.03.18 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Label | g128_6 | g128_7 | g128_8 | g128_9 | g128_1 | g128_10 | g128_2 | g128_3 | g128_4 | g128_5 | g128_6 | g128_7 | g128_8 | g128_9 | gor128_1 | gor128_2 | gor128_3 | gor128_4 |
| Ox% (Na) | 0.52 | 0.65 | 0.54 | 0.57 | 0.55 | 0.54 | 0.61 | 0.62 | 0.62 | 0.52 | 0.56 | 0.62 | 0.59 | 0.56 | 0.46 | 0.52 | 0.56 | 0.53 |
| Ox% (Mg) | 26.17 | 26.26 | 26.20 | 26.04 | 25.70 | 25.81 | 25.60 | 25.71 | 25.94 | 25.66 | 25.85 | 25.64 | 25.93 | 25.99 | 25.53 | 25.37 | 25.27 | 25.37 |
| Ox% (Al) | 10.07 | 10.03 | 9.94 | 10.00 | 9.72 | 9.87 | 9.68 | 9.65 | 9.85 | 9.63 | 9.70 | 9.74 | 9.85 | 9.63 | 10.07 | 9.80 | 9.77 | 9.94 |
| Ox% (Si) | 46.38 | 46.30 | 46.21 | 46.49 | 45.87 | 45.92 | 46.30 | 45.96 | 46.49 | 46.44 | 46.61 | 46.42 | 46.44 | 45.89 | 46.46 | 46.66 | 46.32 | 46.20 |
| Ox% (P) | 0.00 | 0.05 | 0.00 | 0.05 | 0.05 | 0.04 | 0.06 | 0.05 | 0.08 | 0.05 | 0.04 | 0.07 | 0.00 | 0.00 | 0.03 | 0.06 | 0.05 | 0.06 |
| Ox% (Cl) | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.01 | 0.02 | 0.02 | 0.03 | | | | |
| Ox% (K) | 0.05 | 0.05 | 0.07 | 0.03 | 0.04 | 0.03 | 0.03 | 0.06 | 0.04 | 0.01 | 0.03 | 0.03 | 0.02 | 0.04 | 0.03 | 0.04 | 0.03 | 0.04 |
| Ox% (Ca) | 6.12 | 6.23 | 6.16 | 6.24 | 6.37 | 6.02 | 6.42 | 6.32 | 6.49 | 5.86 | 5.66 | 5.94 | 6.34 | 6.47 | 6.11 | 6.19 | 6.12 | 6.14 |
| Ox% (Ti) | 0.29 | 0.26 | 0.25 | 0.33 | 0.26 | 0.25 | 0.29 | 0.28 | 0.29 | 0.25 | 0.22 | 0.24 | 0.31 | 0.26 | 0.26 | 0.29 | 0.27 | 0.23 |
| Ox% (Mn) | 0.15 | 0.24 | 0.30 | 0.14 | 0.13 | 0.19 | 0.12 | 0.22 | 0.13 | 0.19 | 0.21 | 0.14 | 0.15 | 0.18 | 0.13 | 0.14 | 0.16 | 0.14 |
| Ox% (Fe) | 9.82 | 10.43 | 9.95 | 9.93 | 10.13 | 10.01 | 9.69 | 10.29 | 9.96 | 10.09 | 10.18 | 9.93 | 9.49 | 10.19 | 9.87 | 9.73 | 9.84 | 9.70 |
| Total | 99.57 | 100.50 | 99.63 | 99.82 | 98.84 | 98.69 | 98.81 | 99.15 | 99.92 | 98.71 | 99.07 | 98.78 | 99.14 | 99.25 | 98.95 | 98.81 | 98.38 | 98.35 |

| Date | 10.08.31 | 10.08.31 | 10.08.31 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Label | gor128_5 | gor128_6 | gor128_7 | g128_1 | g128_2 | g128_3 | g128_4 | g128_5 | g128_6 | g128_7 | g128_8 | g132 | g132_10 | g132_11 | g132_3 | g132_5 | g132_6 | g132_7 |
| Ox% (Na) | 0.58 | 0.50 | 0.62 | 0.50 | 0.60 | 0.52 | 0.56 | 0.61 | 0.51 | 0.59 | 0.55 | 0.74 | 0.78 | 0.74 | 0.79 | 0.79 | 0.88 | 0.87 |
| Ox% (Mg) | 25.25 | 25.40 | 25.11 | 26.14 | 26.04 | 25.51 | 25.57 | 26.03 | 25.80 | 26.06 | 25.74 | 22.33 | 21.92 | 22.05 | 22.16 | 22.36 | 22.30 | 22.41 |
| Ox% (Al) | 9.86 | 10.08 | 9.90 | 9.96 | 9.71 | 9.81 | 9.65 | 9.78 | 9.71 | 9.82 | 9.82 | 10.85 | 10.76 | 10.81 | 10.96 | 10.94 | 10.97 | 10.96 |
| Ox% (Si) | 46.36 | 46.63 | 46.51 | 46.06 | 46.22 | 46.30 | 45.75 | 46.07 | 45.91 | 46.03 | 45.88 | 45.55 | 45.49 | 45.46 | 45.75 | 45.63 | 45.68 | 45.62 |
| Ox% (P) | 0.05 | 0.03 | 0.04 | 0.03 | 0.04 | 0.03 | 0.00 | 0.04 | 0.02 | 0.04 | 0.04 | 0.03 | 0.04 | 0.06 | 0.05 | 0.06 | 0.05 | 0.04 |
| Ox% (Cl) | | | | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.00 | 0.01 | 0.02 |
| Ox% (K) | 0.03 | 0.02 | 0.03 | 0.04 | 0.06 | 0.05 | 0.03 | 0.00 | 0.03 | 0.04 | 0.03 | 0.04 | 0.02 | 0.06 | 0.07 | 0.02 | 0.03 | 0.04 |
| Ox% (Ca) | 6.15 | 6.15 | 6.08 | 6.27 | 6.25 | 6.24 | 6.35 | 6.14 | 6.24 | 6.28 | 6.20 | 8.54 | 8.35 | 8.43 | 8.62 | 8.35 | 8.36 | 8.50 |
| Ox% (Ti) | 0.25 | 0.29 | 0.22 | 0.26 | 0.23 | 0.28 | 0.32 | 0.29 | 0.33 | 0.29 | 0.26 | 0.32 | 0.27 | 0.28 | 0.27 | 0.27 | 0.26 | 0.31 |
| Ox% (Mn) | 0.17 | 0.21 | 0.09 | 0.16 | 0.19 | 0.18 | 0.17 | 0.20 | 0.22 | 0.23 | 0.19 | 0.13 | 0.18 | 0.09 | 0.18 | 0.11 | 0.13 | 0.10 |
| Ox% (Fe) | 10.02 | 9.91 | 9.86 | 9.66 | 9.60 | 9.66 | 10.02 | 10.13 | 10.04 | 9.62 | 10.00 | 10.30 | 10.54 | 10.16 | 10.28 | 10.27 | 10.34 | 10.48 |
| Total | 98.72 | 99.22 | 98.44 | 99.09 | 98.94 | 98.58 | 98.42 | 99.31 | 98.81 | 98.99 | 98.72 | 98.86 | 98.35 | 98.15 | 99.14 | 98.80 | 99.01 | 99.35 |

| Date | 10.10.20 | 10.10.20 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.03.18 | 10.03.18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Label | g132_8 | g132_9 | GOR132_ | GOR132_1 | GOR132_1 | GOR132_1 | GOR132_1 | GOR132_1 | GOR132_2 | GOR132_3 | GOR132_4 | GOR132_5 | GOR132_6 | GOR132_7 | GOR132_8 | GOR132_9 | sthl_1 | sthl_2 |
| Ox% (Na) | 0.82 | 0.68 | 0.66 | 0.87 | 0.90 | 0.74 | 0.91 | 0.88 | 0.72 | 0.80 | 0.78 | 0.87 | 0.77 | 0.86 | 0.83 | 0.79 | 4.54 | 4.50 |
| Ox% (Mg) | 22.50 | 22.25 | 21.88 | 21.90 | 21.87 | 21.67 | 22.19 | 21.94 | 22.30 | 22.19 | 22.14 | 22.06 | 21.98 | 22.34 | 21.75 | 21.86 | 1.97 | 2.03 |
| Ox% (Al) | 10.79 | 11.00 | 10.80 | 10.83 | 11.02 | 10.84 | 11.08 | 10.87 | 10.83 | 10.56 | 10.59 | 10.78 | 10.61 | 10.65 | 10.82 | 10.85 | 17.81 | 18.11 |
| Ox% (Si) | 45.45 | 45.33 | 45.73 | 46.06 | 46.39 | 46.13 | 45.88 | 46.24 | 45.43 | 45.00 | 45.64 | 45.57 | 44.92 | 45.29 | 45.90 | 46.01 | 63.75 | 63.67 |
| Ox% (P) | 0.06 | 0.05 | 0.12 | 0.02 | 0.05 | 0.10 | 0.03 | 0.02 | 0.06 | 0.07 | 0.01 | 0.01 | 0.05 | 0.08 | 0.06 | 0.08 | 0.19 | 0.15 |
| Ox% (Cl) | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.03 | 0.03 |
| Ox% (K) | 0.04 | 0.04 | 0.03 | 0.05 | 0.00 | 0.01 | 0.04 | 0.01 | 0.03 | 0.01 | 0.03 | 0.02 | 0.00 | 0.05 | 0.01 | 0.04 | 1.34 | 1.33 |
| Ox% (Ca) | 8.43 | 8.42 | 8.46 | 8.38 | 8.45 | 8.44 | 8.41 | 8.42 | 8.63 | 8.39 | 8.34 | 8.47 | 8.37 | 8.53 | 8.28 | 8.21 | 5.28 | 5.23 |
| Ox% (Ti) | 0.30 | 0.32 | 0.29 | 0.33 | 0.28 | 0.38 | 0.29 | 0.31 | 0.28 | 0.30 | 0.29 | 0.32 | 0.28 | 0.31 | 0.35 | 0.32 | 0.65 | 0.73 |
| Ox% (Mn) | 0.14 | 0.08 | 0.19 | 0.13 | 0.10 | 0.15 | 0.25 | 0.11 | 0.24 | 0.21 | 0.05 | 0.15 | 0.22 | 0.12 | 0.16 | 0.17 | 0.14 | 0.13 |
| Ox% (Fe) | 10.37 | 10.21 | 10.66 | 10.53 | 10.27 | 10.11 | 10.39 | 10.49 | 10.04 | 10.24 | 10.15 | 9.76 | 10.17 | 10.44 | 10.47 | 10.33 | 4.08 | 4.23 |
| Total | 98.90 | 98.39 | 98.82 | 99.10 | 99.35 | 98.59 | 99.47 | 99.29 | 98.55 | 97.79 | 98.01 | 98.00 | 97.39 | 98.69 | 98.64 | 98.67 | 99.78 | 100.13 |

| Date | 10.03.18 | 10.03.18 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.04.26 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Label | sthl_3 | sthl_4 | StHs1 | StHs10 | StHs12 | StHs13 | StHs14 | StHs15 | StHs2 | StHs3 | StHs4 | StHs5 | StHs6 | StHs7 | StHs9 | sthl_1 | sthl_10 | sthl_2 |
| Ox% (Na) | 4.48 | 4.43 | 4.67 | 4.56 | 4.42 | 4.55 | 4.47 | 4.32 | 4.56 | 4.76 | 4.51 | 4.68 | 4.48 | 4.85 | 4.49 | 4.46 | 4.41 | 5.09 |
| Ox% (Mg) | 2.00 | 2.09 | 1.94 | 1.92 | 1.95 | 1.88 | 1.91 | 1.91 | 1.94 | 2.02 | 1.98 | 1.90 | 1.94 | 1.91 | 1.93 | 1.96 | 1.93 | 1.92 |
| Ox% (Al) | 18.03 | 17.99 | 17.73 | 17.43 | 17.43 | 17.64 | 17.52 | 17.45 | 16.43 | 16.72 | 17.56 | 17.45 | 17.33 | 17.57 | 17.34 | 17.35 | 17.52 | 17.22 |
| Ox% (Si) | 63.27 | 63.51 | 63.94 | 64.01 | 63.65 | 63.83 | 63.80 | 63.82 | 60.37 | 61.15 | 63.35 | 63.38 | 63.37 | 63.72 | 63.89 | 63.35 | 63.68 | 63.38 |
| Ox% (P) | 0.18 | 0.19 | 0.18 | 0.13 | 0.17 | 0.20 | 0.18 | 0.14 | 0.22 | 0.15 | 0.21 | 0.17 | 0.17 | 0.17 | 0.15 | 0.19 | 0.18 | 0.16 |
| Ox% (Cl) | 0.03 | 0.03 | 0.03 | 0.02 | 0.01 | 0.03 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 |
| Ox% (K) | 1.32 | 1.30 | 1.28 | 1.36 | 1.29 | 1.32 | 1.32 | 1.30 | 1.32 | 1.34 | 1.26 | 1.32 | 1.30 | 1.31 | 1.27 | 1.32 | 1.39 | 1.21 |
| Ox% (Ca) | 5.30 | 5.20 | 5.31 | 5.31 | 5.27 | 5.20 | 5.29 | 5.24 | 5.29 | 5.24 | 5.17 | 5.24 | 5.22 | 5.27 | 5.18 | 5.11 | 5.33 | 5.10 |
| Ox% (Ti) | 0.70 | 0.78 | 0.67 | 0.72 | 0.69 | 0.68 | 0.73 | 0.72 | 0.63 | 0.71 | 0.74 | 0.72 | 0.73 | 0.75 | 0.69 | 0.71 | 0.73 | 0.63 |
| Ox% (Mn) | 0.00 | 0.16 | 0.05 | 0.03 | 0.06 | 0.00 | 0.06 | 0.10 | 0.05 | 0.00 | 0.07 | 0.06 | 0.14 | 0.08 | 0.05 | 0.06 | 0.10 | 0.04 |
| Ox% (Fe) | 4.34 | 4.25 | 4.29 | 4.51 | 4.33 | 4.57 | 4.61 | 4.31 | 4.36 | 4.29 | 4.53 | 4.42 | 4.39 | 4.47 | 4.69 | 4.29 | 4.36 | 4.55 |
| Total | 99.66 | 99.93 | 100.11 | 100.00 | 99.26 | 99.91 | 99.91 | 99.33 | 95.17 | 96.38 | 99.39 | 99.39 | 99.06 | 100.10 | 99.70 | 98.81 | 99.63 | 99.30 |

| Date | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.08.31 | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Label | sthl_3 | sthl_4 | sthl_5 | sthl_6 | sthl_7 | sthl_8 | sthl_9 | sths_1 | sths_2 | sths_3 | sths_4 | sths_5 | sths_6 | sths_7 | sthl_1 | sthl_2 | sthl_4 | sthl_5 |
| Ox% (Na) | 4.54 | 4.43 | 4.72 | 4.61 | 4.79 | 4.49 | 4.39 | 4.57 | 4.49 | 4.50 | 4.66 | 4.40 | 4.50 | 4.50 | 4.72 | 4.35 | 4.35 | 4.49 |
| Ox% (Mg) | 1.91 | 1.94 | 1.90 | 1.94 | 1.94 | 1.95 | 1.86 | 1.92 | 1.93 | 1.88 | 1.89 | 1.95 | 1.90 | 1.97 | 1.99 | 1.98 | 1.95 | 1.91 |
| Ox% (Al) | 17.47 | 17.64 | 17.51 | 17.47 | 17.42 | 17.50 | 17.22 | 17.91 | 17.83 | 17.40 | 17.49 | 17.58 | 17.68 | 17.64 | 17.66 | 17.82 | 17.75 | 17.64 |
| Ox% (Si) | 63.40 | 63.77 | 63.25 | 63.85 | 63.91 | 63.54 | 63.54 | 63.23 | 63.56 | 63.40 | 63.59 | 63.35 | 63.45 | 63.63 | 63.27 | 63.31 | 63.34 | 63.32 |
| Ox% (P) | 0.18 | 0.15 | 0.17 | 0.21 | 0.21 | 0.18 | 0.16 | 0.18 | 0.13 | 0.22 | 0.21 | 0.11 | 0.17 | 0.13 | 0.14 | 0.18 | 0.19 | 0.17 |
| Ox% (Cl) | 0.02 | 0.01 | 0.01 | 0.00 | 0.03 | 0.01 | 0.02 | | | | | | | | 0.03 | 0.01 | 0.02 | 0.03 |
| Ox% (K) | 1.27 | 1.29 | 1.27 | 1.27 | 1.27 | 1.31 | 1.36 | 1.26 | 1.28 | 1.32 | 1.29 | 1.21 | 1.29 | 1.24 | 1.31 | 1.32 | 1.26 | 1.27 |
| Ox% (Ca) | 5.31 | 5.16 | 5.31 | 5.31 | 4.94 | 4.87 | 5.43 | 5.29 | 5.17 | 5.14 | 5.30 | 5.35 | 5.19 | 5.16 | 5.28 | 5.23 | 5.35 | 5.23 |
| Ox% (Ti) | 0.71 | 0.69 | 0.76 | 0.68 | 0.59 | 0.69 | 0.70 | 0.69 | 0.75 | 0.68 | 0.66 | 0.74 | 0.69 | 0.64 | 0.70 | 0.69 | 0.67 | 0.65 |
| Ox% (Mn) | 0.08 | 0.09 | 0.06 | 0.03 | 0.13 | 0.04 | 0.01 | 0.07 | 0.08 | 0.08 | 0.12 | 0.07 | 0.11 | 0.00 | 0.10 | 0.13 | 0.12 | 0.07 |
| Ox% (Fe) | 4.43 | 4.79 | 4.61 | 4.53 | 4.46 | 4.43 | 4.27 | 4.77 | 4.46 | 4.13 | 4.57 | 4.31 | 4.24 | 4.57 | 4.34 | 4.25 | 4.48 | 4.12 |
| Total | 99.32 | 99.95 | 99.56 | 99.90 | 99.68 | 99.01 | 98.96 | 99.89 | 99.68 | 98.76 | 99.80 | 99.07 | 99.21 | 99.48 | 99.53 | 99.28 | 99.48 | 98.90 |

| Date | 10.10.20 | 10.10.20 | 10.10.20 | 10.10.20 | 10.11.23 | 10.11.23 | 10.11.23 | 10.11.23 |
|---|---|---|---|---|---|---|---|---|
| Label | sthl_6 | sthl_7 | sthl_8 | sthl_9 | sthl_1 | sthl_2 | sthl_3 | sthl_4 |
| Ox% (Na) | 4.33 | 4.89 | 4.65 | 4.44 | 4.52 | 4.54 | 4.72 | 4.84 |
| Ox% (Mg) | 1.97 | 1.87 | 2.05 | 1.93 | 1.97 | 1.90 | 1.99 | 1.97 |
| Ox% (Al) | 17.52 | 16.87 | 17.93 | 17.76 | 17.49 | 17.49 | 17.51 | 17.47 |
| Ox% (Si) | 63.18 | 63.11 | 63.44 | 63.18 | 63.18 | 63.26 | 63.14 | 63.56 |
| Ox% (P) | 0.19 | 0.15 | 0.16 | 0.16 | 0.16 | 0.13 | 0.13 | 0.14 |
| Ox% (Cl) | 0.00 | 0.02 | 0.03 | 0.01 | 0.00 | 0.00 | 0.03 | 0.00 |
| Ox% (K) | 1.26 | 1.20 | 1.27 | 1.34 | 1.31 | 1.33 | 1.41 | 1.35 |
| Ox% (Ca) | 5.33 | 4.99 | 5.28 | 5.25 | 5.35 | 5.23 | 5.38 | 5.28 |
| Ox% (Ti) | 0.62 | 0.63 | 0.64 | 0.67 | 0.67 | 0.67 | 0.68 | 0.72 |
| Ox% (Mn) | 0.08 | 0.09 | 0.03 | 0.07 | 0.16 | 0.07 | 0.11 | 0.03 |
| Ox% (Fe) | 4.41 | 4.35 | 4.61 | 4.16 | 4.40 | 4.39 | 4.54 | 4.42 |
| Total | 98.89 | 98.18 | 100.09 | 98.97 | 99.21 | 99.01 | 99.61 | 99.79 |

| | ATHO | | GOR-128 | | GOR-132 | | STHS 6/80 | |
|---|---|---|---|---|---|---|---|---|
| **Label** | **Average** | **St Dev** | **Average** | **St Dev** | **Average** | **St Dev** | **Average** | **St Dev** |
| **Ox%(Na)** | **4.05** | **0.13** | **0.56** | **0.06** | **0.80** | **0.07** | **4.56** | **0.16** |
| **Ox%(Mg)** | **0.10** | **0.02** | **25.83** | **0.39** | **22.10** | **0.23** | **1.94** | **0.05** |
| **Ox%(Al)** | **12.21** | **0.13** | **9.84** | **0.17** | **10.83** | **0.14** | **17.53** | **0.31** |
| **Ox%(Si)** | **75.40** | **0.39** | **46.29** | **0.27** | **45.66** | **0.36** | **63.38** | **0.62** |
| **Ox%(P)** | **0.02** | **0.02** | **0.04** | **0.02** | **0.05** | **0.03** | **0.17** | **0.03** |
| **Ox%(Cl)** | **0.05** | **0.01** | **0.01** | **0.01** | **0.01** | **0.01** | **0.02** | **0.01** |
| **Ox%(K)** | **2.72** | **0.06** | **0.03** | **0.01** | **0.03** | **0.02** | **1.30** | **0.04** |
| **Ox%(Ca)** | **1.71** | **0.04** | **6.19** | **0.17** | **8.43** | **0.10** | **5.24** | **0.11** |
| **Ox%(Ti)** | **0.25** | **0.03** | **0.27** | **0.03** | **0.30** | **0.03** | **0.69** | **0.04** |
| **Ox%(Mn)** | **0.11** | **0.05** | **0.18** | **0.05** | **0.15** | **0.05** | **0.07** | **0.04** |
| **Ox%(Fe)** | **3.29** | **0.12** | **9.91** | **0.23** | **10.30** | **0.19** | **4.41** | **0.16** |
| **Total** | **99.89** | **0.46** | **99.16** | **0.71** | **98.66** | **0.54** | **99.31** | **0.89** |

| | ATHO | | | | | GOR-128 | | | | | GOR-132 | | | | | STHS 6/80 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | **Average** | **usgs cert** | **+/-** | **Bias** | **% Bias** | **Average** | **usgs cert** | **+/-** | **Bias** | **% Bias** | **Average** | **usgs cert** | **+/-** | **Bias** | **% Bias** | **Average** | **usgs cert** | **+/-** | **Bias** | **% Bias** |
| Ox% (Na) | 4.05 | 3.75 | 0.31 | 0.30 | 7.97 | 0.56 | 0.57 | 0.03 | -0.01 | -2.31 | 0.80 | 0.83 | 0.04 | -0.03 | -3.28 | 4.56 | 4.44 | 0.14 | 0.12 | 2.64 |
| Ox% (Mg) | 0.10 | 0.10 | 0.01 | -0.01 | -7.41 | 25.83 | 26.00 | 0.30 | -0.17 | -0.64 | 22.10 | 22.40 | 2.00 | -0.30 | -1.33 | 1.94 | 1.97 | 0.04 | -0.03 | -1.35 |
| Ox% (Al) | 12.21 | 12.20 | 0.20 | 0.01 | 0.12 | 9.84 | 9.91 | 0.17 | -0.07 | -0.68 | 10.83 | 11.00 | 0.20 | -0.17 | -1.51 | 17.53 | 17.80 | 0.20 | -0.27 | -1.53 |
| Ox% (Si) | 75.40 | 75.60 | 0.70 | -0.20 | -0.27 | 46.29 | 46.10 | 0.40 | 0.19 | 0.41 | 45.66 | 45.50 | 0.40 | 0.16 | 0.35 | 63.38 | 63.70 | 0.50 | -0.32 | -0.50 |
| Ox% (P) | 0.02 | 0.03 | 0.00 | 0.00 | -4.42 | 0.04 | 0.03 | 0.01 | 0.01 | 50.09 | 0.05 | 0.04 | 0.01 | 0.02 | 44.28 | 0.17 | 0.16 | 0.02 | 0.01 | 3.57 |
| Ox% (Cl) | 0.05 | | | | | 0.01 | | | | | 0.01 | | | | | 0.02 | | | | |
| Ox% (K) | 2.72 | 2.64 | 0.09 | 0.08 | 2.87 | 0.03 | 0.04 | 0.01 | 0.00 | -7.86 | 0.03 | 0.03 | 0.00 | 0.00 | -3.44 | 1.30 | 1.29 | 0.02 | 0.01 | 0.75 |
| Ox% (Ca) | 1.71 | 1.70 | 0.03 | 0.01 | 0.31 | 6.19 | 6.24 | 0.12 | -0.05 | -0.74 | 8.43 | 8.45 | 0.12 | -0.02 | -0.29 | 5.24 | 5.28 | 0.09 | -0.04 | -0.82 |
| Ox% (Ti) | 0.25 | 0.26 | 0.02 | 0.00 | -0.75 | 0.27 | 0.29 | 0.01 | -0.02 | -6.05 | 0.30 | 0.31 | 0.01 | -0.01 | -1.72 | 0.69 | 0.70 | 0.02 | -0.01 | -1.71 |
| Ox% (Mn) | 0.11 | 0.11 | 0.01 | 0.00 | 1.48 | 0.18 | 0.18 | 0.01 | 0.00 | -0.34 | 0.15 | 0.15 | 0.01 | -0.01 | -4.07 | 0.07 | 0.08 | 0.00 | 0.00 | -2.71 |
| Ox% (Fe) | 3.29 | 3.27 | 0.10 | 0.02 | 0.49 | 9.91 | 9.81 | 0.12 | 0.10 | 1.05 | 10.30 | 10.10 | 0.10 | 0.20 | 2.03 | 4.41 | 4.37 | 0.07 | 0.04 | 0.93 |

Figure D4: Table of the secondary standards run during glass analysis along with the USGS cert value for each standard.

## APPENDIX E – LA-ICP-MS Preparation, Data, & Standards

Sample Preparation

- The same stubs were used for the LA-ICP-MS analysis as were used for the EMPA (once they had been polished to remove the carbon coating), and where possible, the exact same location was analysed on each shard.
- The LA-ICP-MS analysis was carried out using an Agilent 7500 coupled to a Resonetics 193 nm ArF excimer laser ablation system.
- The LA-ICP-MS equipment was set up, tuned (using NIST SRM 612) and calibrated by either Dr. Emma Tomlinson or Dr. Christina Manning with secondary standards (atho, gor128 and sths 6/80) used to check the precision and accuracy of the run.
- Tuning: 74µm; 5Hz; 1mm/min
- Gas Flow: 850ml/min He and 5ml/min $N_2$
- Acquisition: 20µm spot size; 40sec ablation at 5Hz with 20sec background either side.
- The internal standard used was $^{29}Si$ and the Si concentration of each shard had previously been determined though EMP analysis.
- Laser alignment was checked by test firing a single shot into the resin.
- Points for analysis were programmed into the laser and once all points were programmed, it was set running.
- The data was then reduced by subtracting the background signal from the data and then by calculating the concentration of the data for each time slice and then averaging these values to give the determined concentration.
- The final Ca value for the sths6/80 standard was then compared to the published value and this was used to correct any bias in the run.

LA-ICP-MS Data

The LA-ICP-MS glass data produced during this research is shown in the tables on the next 7 pages. The tables are divided by the location of where the samples were collected: on La Fossa and Vulcanello. The start of the sample label is the sample name (and this will match up with the name given in tables B1-B4). The second part of the sample label is the clast number within the analytical stub and the final part is the analysis number for that individual clast, if more than one analysis was carried out on an individual shard.

| Eruptive Unit | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | Pietre Cotte | Pietre Cotte | Pietre Cotte |
|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | AT13.1a | AT13.2 | AT13.2a | AT13.4 | AT13.5 | AT13.10 | AT13.11 | S90b2.1 | S90b2.2 | S90b2.3 |
| **Si29** | 333280 | 340626 | 340626 | 329669 | 334790 | 321981 | 328657 | 298708 | 299966 | 298451 |
| **Ca43** | 21544 | 12851 | 12696 | 12107 | 11756 | 11488 | 11429 | 21830 | 23175 | 23455 |
| **Sc45** | 18 | 14 | 17 | 13 | 13 | 13 | 14 | 17 | 19 | 17 |
| **Ti47** | 2229 | 1863 | 2043 | 2075 | 1842 | 1798 | 2349 | 2548 | 2653 | 2578 |
| **V51** | 77.9 | 43.0 | 45.7 | 45.5 | 41.6 | 41.7 | 54.6 | 101.8 | 105.9 | 103.9 |
| **Rb85** | 324 | 348 | 369 | 349 | 328 | 334 | 340 | 272 | 283 | 275 |
| **Sr88** | 238 | 231 | 198 | 199 | 217 | 219 | 182 | 631 | 711 | 693 |
| **Y89** | 33 | 30 | 28 | 28 | 29 | 31 | 27 | 23 | 22 | 22 |
| **Zr90** | 289 | 288 | 298 | 291 | 278 | 287 | 290 | 259 | 268 | 258 |
| **Nb93** | 39 | 41 | 43 | 42 | 41 | 41 | 42 | 32 | 35 | 33 |
| **Ba138** | 326 | 325 | 306 | 308 | 322 | 317 | 271 | 1134 | 1166 | 1141 |
| **La139** | 80.2 | 83.6 | 87.2 | 80.1 | 77.9 | 82.5 | 81.6 | 79.8 | 80.7 | 78.5 |
| **Ce140** | 150 | 156 | 170 | 146 | 145 | 156 | 154 | 141 | 145 | 137 |
| **Pr141** | 14.8 | 14.4 | 17.2 | 14.0 | 13.3 | 14.8 | 14.4 | 13.8 | 14.1 | 13.6 |
| **Nd146** | 55 | 51 | 56 | 48 | 46 | 51 | 48 | 49 | 48 | 46 |
| **Sm147** | 9.4 | 8.9 | 9.1 | 8.1 | 8.3 | 7.0 | 9.2 | 9.0 | 9.4 | 8.8 |
| **Sm149** | 9.9 | 8.4 | 9.7 | 7.9 | 8.6 | 8.7 | 7.8 | 8.2 | 8.6 | 8.7 |
| **Eu153** | 1.1 | 0.8 | 0.8 | 0.8 | 0.7 | 0.7 | 0.8 | 1.5 | 1.5 | 1.6 |
| **Gd157** | 8.4 | 7.0 | 7.1 | 6.3 | 5.6 | 5.9 | 7.2 | 6.2 | 6.0 | 6.0 |
| **Dy163** | 6.1 | 5.9 | 4.8 | 4.4 | 5.1 | 5.3 | 4.9 | 3.8 | 4.5 | 4.1 |
| **Er166** | 3.6 | 3.5 | 3.2 | 2.8 | 3.2 | 3.3 | 3.1 | 2.3 | 2.3 | 2.5 |
| **Yb172** | 3.8 | 4.1 | 3.5 | 3.5 | 3.5 | 3.4 | 3.3 | 2.5 | 2.4 | 2.7 |
| **Lu175** | 0.6 | 0.6 | 0.5 | 0.5 | 0.6 | 0.5 | 0.6 | 0.4 | 0.4 | 0.4 |
| **Ta181** | 2.5 | 2.8 | 2.9 | 2.5 | 2.4 | 2.7 | 2.9 | 1.8 | 2.0 | 1.8 |
| **Pb208** | 35 | 39 | 40 | 37 | 38 | 37 | 39 | 36 | 35 | 33 |
| **Th232** | 56 | 59 | 58 | 59 | 57 | 58 | 56 | 40 | 41 | 39 |
| **U238** | 18 | 19 | 18 | 17 | 18 | 18 | 17 | 12 | 13 | 12 |

| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | S90b2.4 | S90b2.5 | S90b2.6 | S90b2.7 | S90ca.1 | S90ca.4 | S90ca.5 | S90ca.6 | S90ca.7 | S90cb.1 |
| **Si29** | 297655 | 299876 | 300832 | 299649 | 299186 | 298995 | 299302 | 299493 | 299156 | 299966 |
| **Ca43** | 24603 | 22761 | 22710 | 20864 | 22816 | 24202 | 23173 | 22662 | 21159 | 20360 |
| **Sc45** | 18 | 18 | 16 | 19 | 18 | 20 | 17 | 18 | 17 | 17 |
| **Ti47** | 2671 | 2552 | 2484 | 2471 | 2566 | 2734 | 2786 | 2663 | 2615 | 2795 |
| **V51** | 106.1 | 105.2 | 98.8 | 100.4 | 101.8 | 102.1 | 103.6 | 102.4 | 97.5 | 105.0 |
| **Rb85** | 292 | 279 | 271 | 301 | 279 | 280 | 275 | 278 | 264 | 304 |
| **Sr88** | 717 | 691 | 657 | 642 | 693 | 712 | 705 | 690 | 655 | 714 |
| **Y89** | 24 | 21 | 21 | 22 | 23 | 23 | 24 | 22 | 21 | 24 |
| **Zr90** | 275 | 252 | 246 | 244 | 261 | 256 | 256 | 259 | 233 | 260 |
| **Nb93** | 34 | 32 | 31 | 33 | 33 | 33 | 33 | 33 | 32 | 34 |
| **Ba138** | 1191 | 1134 | 1079 | 1083 | 1152 | 1151 | 1134 | 1116 | 1059 | 1209 |
| **La139** | 80.5 | 76.7 | 74.0 | 75.1 | 80.5 | 77.8 | 78.6 | 78.3 | 71.1 | 83.1 |
| **Ce140** | 144 | 138 | 134 | 133 | 141 | 139 | 137 | 136 | 130 | 147 |
| **Pr141** | 14.8 | 12.9 | 13.3 | 13.1 | 13.8 | 13.7 | 14.0 | 12.9 | 12.3 | 14.7 |
| **Nd146** | 51 | 47 | 45 | 43 | 48 | 48 | 49 | 44 | 43 | 48 |
| **Sm147** | 11.2 | 8.2 | 7.3 | 8.7 | 8.7 | 8.1 | 7.9 | 8.2 | 8.5 | 9.1 |
| **Sm149** | 9.4 | 7.8 | 7.8 | 8.8 | 8.8 | 8.9 | 9.7 | 8.0 | 8.5 | 9.3 |
| **Eu153** | 1.4 | 1.4 | 1.5 | 1.3 | 1.4 | 1.5 | 1.4 | 1.5 | 1.4 | 1.4 |
| **Gd157** | 6.7 | 6.1 | 6.6 | 6.4 | 5.1 | 5.7 | 6.5 | 5.6 | 5.9 | 6.0 |
| **Dy163** | 4.3 | 4.2 | 3.8 | 4.2 | 4.4 | 4.1 | 4.1 | 4.2 | 3.7 | 4.5 |
| **Er166** | 2.5 | 2.3 | 2.1 | 2.1 | 2.4 | 2.1 | 2.3 | 2.5 | 2.3 | 2.5 |
| **Yb172** | 3.1 | 2.8 | 2.5 | 2.6 | 2.6 | 2.7 | 2.8 | 2.4 | 2.4 | 2.9 |
| **Lu175** | 0.4 | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.4 |
| **Ta181** | 1.9 | 1.9 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 2.1 | 1.9 |
| **Pb208** | 34 | 34 | 33 | 35 | 34 | 35 | 33 | 34 | 32 | 50 |
| **Th232** | 41 | 38 | 37 | 37 | 41 | 40 | 39 | 39 | 34 | 41 |
| **U238** | 12.1 | 11.6 | 11.7 | 11.7 | 12.7 | 12.0 | 12.3 | 12.3 | 10.9 | 12.8 |

| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | S90cb.2 | S90cb.3 | S90cb.4 | S90cb.5 | S90cb.6 | S90cb.7 | S90cb.7i1 | S90cb.7.i2 | S90.cb.7.i3 | AT1.w2 |
| **Si29** | 298511 | 299126 | 299841 | 298692 | 298642 | 298828 | 299115 | 299115 | 299115 | 372048 |
| **Ca43** | 22515 | 23199 | 25293 | 23027 | 23004 | 22173 | 22372 | 23998 | 22506 | 11224 |
| **Sc45** | 17 | 18 | 18 | 18 | 19 | 18 | 17 | 18 | 18 | 7 |
| **Ti47** | 2687 | 2761 | 3092 | 2758 | 3263 | 3154 | 3476 | 3278 | 3257 | 1803 |
| **V51** | 100.4 | 104.6 | 104.6 | 102.7 | 104.5 | 100.1 | 98.9 | 107.1 | 104.9 | 26.3 |
| **Rb85** | 280 | 283 | 296 | 287 | 276 | 273 | 279 | 288 | 274 | 434 |
| **Sr88** | 687 | 699 | 745 | 713 | 709 | 687 | 617 | 681 | 686 | 100 |
| **Y89** | 23 | 23 | 23 | 24 | 22 | 22 | 24 | 23 | 23 | 46 |
| **Zr90** | 250 | 252 | 274 | 257 | 257 | 254 | 272 | 265 | 259 | 314 |
| **Nb93** | 33 | 33 | 35 | 34 | 33 | 32 | 34 | 33 | 34 | 48 |
| **Ba138** | 1118 | 1137 | 1200 | 1135 | 1147 | 1092 | 870 | 1069 | 1058 | 133 |
| **La139** | 76.4 | 76.5 | 84.4 | 77.8 | 77.2 | 74.8 | 80.0 | 78.3 | 75.8 | 114.7 |
| **Ce140** | 135 | 139 | 147 | 139 | 138 | 134 | 142 | 140 | 138 | 214 |
| **Pr141** | 12.9 | 13.3 | 14.2 | 13.4 | 13.4 | 13.2 | 14.2 | 13.9 | 13.5 | 22.6 |
| **Nd146** | 46 | 45 | 49 | 46 | 47 | 44 | 49 | 47 | 48 | 78 |
| **Sm147** | 7.6 | 8.4 | 8.8 | 9.6 | 8.3 | 8.0 | 8.6 | 8.9 | 8.7 | 12.9 |
| **Sm149** | 8.2 | 9.4 | 9.9 | 8.7 | 7.9 | 8.2 | 7.4 | 8.4 | 7.8 | 12.6 |
| **Eu153** | 1.4 | 1.6 | 1.6 | 1.5 | 1.6 | 1.5 | 1.5 | 1.3 | 1.4 | 0.5 |
| **Gd157** | 5.6 | 6.4 | 7.3 | 5.7 | 5.9 | 5.8 | 6.8 | 6.9 | 5.6 | 10.2 |
| **Dy163** | 4.0 | 4.1 | 5.0 | 4.4 | 4.0 | 3.8 | 4.3 | 4.1 | 3.9 | 8.1 |
| **Er166** | 2.2 | 2.1 | 2.6 | 1.9 | 2.3 | 2.4 | 2.4 | 2.3 | 2.4 | 4.6 |
| **Yb172** | 2.5 | 2.4 | 2.9 | 2.8 | 2.6 | 2.3 | 2.8 | 2.5 | 2.6 | 4.9 |
| **Lu175** | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.4 | 0.3 | 0.4 | 0.4 | 0.8 |
| **Ta181** | 1.9 | 2.0 | 1.8 | 2.0 | 2.0 | 1.9 | 2.1 | 1.9 | 1.8 | 2.9 |
| **Pb208** | 32 | 32 | 33 | 35 | 34 | 34 | 34 | 34 | 35 | 35 |
| **Th232** | 39 | 39 | 40 | 39 | 40 | 38 | 40 | 40 | 39 | 66 |
| **U238** | 12.0 | 12.3 | 12.7 | 12.9 | 12.1 | 12.0 | 13.1 | 12.5 | 12.1 | 21.0 |

| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | AT1.w3 | AT1.w7 | AT1.w6 | LPC1.2 | LPC1.2a | LPC1.3 | LPC1.4 | LPC1.7 | LPC1.8 | LPC1.3a |
| Si29 | 372048 | 372048 | 372048 | 293984 | 293984 | 295263 | 293995 | 296905 | 297766 | 295263 |
| Ca43 | 22187 | 28676 | 40817 | 30395 | 28325 | 26084 | 40139 | 26208 | 29715 | 29820 |
| Sc45 | 5.5 | 8.2 | 12.8 | 16.1 | 14.9 | 14.5 | 20.3 | 14.8 | 17.9 | 15.8 |
| Ti47 | 725 | 3941 | 3912 | 161 | 159 | 148 | 174 | 157 | 144 | 161 |
| V51 | 7.5 | 114.8 | 122.2 | 34.2 | 34.3 | 30.5 | 41.4 | 32.6 | 27.1 | 33.2 |
| Rb85 | 247 | 303 | 265 | 406 | 379 | 399 | 381 | 431 | 425 | 406 |
| Sr88 | 367 | 739 | 1321 | 1065 | 1117 | 948 | 948 | 953 | 917 | 1106 |
| Y89 | 43 | 26 | 27 | 26 | 26 | 27 | 37 | 25 | 24 | 25 |
| Zr90 | 141 | 297 | 277 | 313 | 297 | 303 | 330 | 306 | 298 | 316 |
| Nb93 | 24 | 41 | 35 | 49 | 47 | 46 | 47 | 49 | 46 | 51 |
| Ba138 | 316 | 913 | 1626 | 1879 | 1910 | 1722 | 1664 | 1748 | 1775 | 1944 |
| La139 | 113.4 | 97.9 | 85.6 | 121.4 | 116.4 | 112.7 | 109.2 | 111.1 | 108.7 | 120.0 |
| Ce140 | 216 | 171 | 154 | 216 | 211 | 213 | 220 | 204 | 203 | 218 |
| Pr141 | 21.6 | 16.1 | 15.1 | 21.8 | 19.3 | 20.5 | 23.9 | 19.7 | 19.4 | 20.3 |
| Nd146 | 83.2 | 54.6 | 54.6 | 73.7 | 70.8 | 73.8 | 89.3 | 69.4 | 66.4 | 74.3 |
| Sm147 | 13.8 | 9.2 | 9.1 | 11.3 | 11.4 | 11.0 | 14.7 | 12.0 | 13.3 | 12.6 |
| Sm149 | 14.9 | 8.5 | 8.9 | 15.3 | 15.7 | 12.5 | 13.5 | 13.5 | 15.1 | 13.6 |
| Eu153 | 0.9 | 1.5 | 1.7 | 2.5 | 2.4 | 2.1 | 2.6 | 2.2 | 2.5 | 2.4 |
| Gd157 | 10.4 | 5.5 | 6.3 | 10.7 | 9.8 | 10.7 | 13.1 | 9.7 | 11.8 | 9.2 |
| Dy163 | 8.2 | 4.4 | 5.1 | 6.5 | 5.2 | 5.3 | 8.3 | 5.9 | 6.5 | 6.5 |
| Er166 | 4.0 | 2.4 | 2.9 | 3.3 | 3.5 | 3.8 | 4.6 | 3.3 | 3.2 | 3.7 |
| Yb172 | 3.8 | 2.7 | 2.9 | 3.6 | 3.6 | 3.5 | 4.9 | 3.9 | 4.4 | 4.0 |
| Lu175 | 0.5 | 0.4 | 0.5 | 0.8 | 0.6 | 0.6 | 0.8 | 0.7 | 0.8 | 0.7 |
| Ta181 | 1.4 | 2.3 | 2.2 | 3.1 | 2.9 | 3.0 | 3.0 | 3.0 | 3.0 | 3.2 |
| Pb208 | 32 | 47 | 48 | 53 | 54 | 50 | 52 | 51 | 44 | 57 |
| Th232 | 34 | 49 | 44 | 62 | 59 | 59 | 59 | 61 | 56 | 63 |
| U238 | 11.3 | 15.3 | 13.5 | 18.8 | 18.5 | 17.9 | 18.3 | 18.6 | 19.0 | 19.1 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Commenda | Commenda | Commenda | Commenda | Commenda |
| Label | LPC1 | LPC1.5 | LPC1.6a | LPC1.5a | LPC1.5b | CA5.1 | CA5.3 | CA5.4 | CA5.5 | CA5.6 |
| Si29 | 298844 | 295712 | 295566 | 295712 | 295712 | 300906 | 300906 | 300906 | 300906 | 300906 |
| Ca43 | 28957 | 33708 | 31458 | 29802 | 28288 | 24058 | 24731 | 24631 | 23307 | 24298 |
| Sc45 | 15 | 18 | 16 | 15 | 15 | 8 | 8 | 8 | 8 | 8 |
| Ti47 | 159 | 159 | 161 | 158 | 156 | 3030 | 3104 | 3088 | 3100 | 3060 |
| V51 | 32.9 | 32.9 | 33.6 | 32.5 | 32.6 | 83.0 | 86.3 | 86.8 | 85.0 | 84.0 |
| Rb85 | 430 | 424 | 414 | 408 | 432 | 263 | 261 | 257 | 264 | 264 |
| Sr88 | 1000 | 836 | 1087 | 1060 | 1025 | 768 | 789 | 805 | 770 | 771 |
| Y89 | 27 | 29 | 27 | 26 | 26 | 22 | 22 | 23 | 23 | 22 |
| Zr90 | 317 | 337 | 341 | 323 | 320 | 264 | 265 | 263 | 270 | 266 |
| Nb93 | 52 | 53 | 55 | 54 | 54 | 31 | 32 | 32 | 32 | 32 |
| Ba138 | 1800 | 1534 | 1942 | 1920 | 1881 | 1020 | 1029 | 1025 | 1018 | 1028 |
| La139 | 111.9 | 126.0 | 126.2 | 124.2 | 123.4 | 76.4 | 76.8 | 77.1 | 78.1 | 78.2 |
| Ce140 | 211 | 226 | 221 | 214 | 215 | 137 | 137 | 138 | 137 | 137 |
| Pr141 | 21 | 23 | 22 | 22 | 21 | 13 | 14 | 13 | 14 | 13 |
| Nd146 | 78 | 78 | 76 | 73 | 68 | 45 | 46 | 46 | 47 | 46 |
| Sm147 | 11.7 | 13.6 | 13.2 | 12.9 | 12.8 | 7.7 | 7.9 | 7.5 | 7.5 | 7.9 |
| Sm149 | 14.7 | 13.0 | 13.0 | 12.7 | 13.2 | 7.5 | 7.4 | 7.3 | 7.0 | 7.4 |
| Eu153 | 2.2 | 2.5 | 2.6 | 2.0 | 2.4 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 |
| Gd157 | 9.2 | 10.5 | 9.3 | 11.0 | 8.2 | 5.2 | 4.7 | 5.1 | 4.9 | 5.6 |
| Dy163 | 6.0 | 6.5 | 6.0 | 5.6 | 6.0 | 4.1 | 4.0 | 4.1 | 4.2 | 4.1 |
| Er166 | 3.5 | 3.5 | 3.4 | 3.0 | 3.5 | 2.3 | 2.3 | 2.2 | 2.4 | 2.4 |
| Yb172 | 3.5 | 4.3 | 3.9 | 3.6 | 3.8 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 |
| Lu175 | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Ta181 | 2.7 | 2.9 | 2.9 | 2.8 | 3.0 | 1.8 | 1.8 | 1.8 | 1.9 | 2.0 |
| Pb208 | 52 | 58 | 57 | 54 | 53 | 35 | 32 | 33 | 32 | 32 |
| Th232 | 61 | 63 | 63 | 62 | 61 | 39 | 40 | 39 | 40 | 40 |
| U238 | 19.7 | 19.8 | 19.3 | 18.9 | 19.7 | 12.2 | 12.1 | 12.0 | 12.3 | 12.3 |
| **Eruptive Unit** | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| Label | CA5.7 | CA5.8 | CA5.9 | CA5.11 | CA5.12 | CA5.15 | CA5.19 | CA5.25 | CA5.25a | CA5.26 |
| Si29 | 300906 | 300906 | 300906 | 300906 | 300906 | 300906 | 300906 | 300906 | 300906 | 300906 |
| Ca43 | 24300 | 23312 | 22932 | 23184 | 23930 | 21273 | 24466 | 21870 | 24999 | 23803 |
| Sc45 | 8 | 8 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Ti47 | 3065 | 3054 | 3018 | 2981 | 3102 | 2852 | 3134 | 2957 | 3152 | 3091 |
| V51 | 86.1 | 83.6 | 81.5 | 81.4 | 85.0 | 78.5 | 86.1 | 87.1 | 88.4 | 83.5 |
| Rb85 | 261 | 265 | 263 | 267 | 256 | 260 | 259 | 254 | 257 | 264 |
| Sr88 | 787 | 739 | 717 | 727 | 774 | 706 | 796 | 715 | 814 | 764 |
| Y89 | 23 | 23 | 20 | 22 | 23 | 20 | 23 | 20 | 23 | 23 |
| Zr90 | 268 | 266 | 251 | 262 | 274 | 244 | 268 | 227 | 267 | 270 |
| Nb93 | 31 | 32 | 31 | 31 | 32 | 30 | 33 | 29 | 32 | 32 |
| Ba138 | 1023 | 978 | 961 | 997 | 1030 | 928 | 1035 | 928 | 1040 | 1023 |
| La139 | 77.6 | 76.1 | 72.5 | 76.1 | 78.3 | 70.3 | 77.5 | 67.5 | 77.9 | 77.1 |
| Ce140 | 137 | 136 | 130 | 134 | 141 | 126 | 138 | 120 | 139 | 138 |
| Pr141 | 13.3 | 13.2 | 12.2 | 13.2 | 13.5 | 12.2 | 13.3 | 11.5 | 13.5 | 13.5 |
| Nd146 | 47.6 | 44.4 | 43.2 | 45.4 | 47.3 | 42.3 | 46.3 | 39.9 | 47.2 | 45.9 |
| Sm147 | 7.3 | 7.7 | 7.0 | 7.8 | 7.5 | 6.9 | 7.8 | 6.7 | 7.6 | 7.8 |
| Sm149 | 7.6 | 7.1 | 6.9 | 7.3 | 7.6 | 6.3 | 7.6 | 6.8 | 8.0 | 7.9 |
| Eu153 | 1.4 | 1.3 | 1.1 | 1.2 | 1.3 | 1.1 | 1.3 | 1.1 | 1.3 | 1.3 |
| Gd157 | 5.2 | 4.9 | 5.0 | 4.9 | 5.4 | 4.6 | 5.3 | 4.5 | 5.3 | 5.2 |
| Dy163 | 4.1 | 4.2 | 4.1 | 4.1 | 4.2 | 3.6 | 4.0 | 3.3 | 4.1 | 4.0 |
| Er166 | 2.3 | 2.3 | 2.2 | 2.3 | 2.3 | 2.1 | 2.4 | 1.9 | 2.3 | 2.4 |
| Yb172 | 2.6 | 2.5 | 2.3 | 2.4 | 2.6 | 2.3 | 2.5 | 2.3 | 2.5 | 2.6 |
| Lu175 | 0.4 | 0.4 | 0.3 | 0.4 | 0.4 | 0.3 | 0.4 | 0.3 | 0.4 | 0.4 |
| Ta181 | 1.9 | 1.8 | 1.7 | 1.9 | 1.9 | 1.7 | 1.9 | 1.6 | 1.8 | 1.8 |
| Pb208 | 32 | 30 | 40 | 32 | 32 | 34 | 32 | 28 | 32 | 32 |
| Th232 | 40 | 40 | 36 | 39 | 41 | 36 | 40 | 32 | 39 | 40 |
| U238 | 12.1 | 12.2 | 12.3 | 12.0 | 12.5 | 11.3 | 12.2 | 10.6 | 12.1 | 12.2 |

| Eruptive Unit | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | S38e.1 | S38e.2 | S38e.3 | S38e.4 | S38e.5 | S38e.6 | S38e.7 | S38e.8 | S38e.10 | S38e.11 |
| Si29 | 357309 | 359113 | 362321 | 359539 | 358265 | 361217 | 358181 | 359382 | 361082 | 358636 |
| Ca43 | 5219 | 5699 | 5645 | 5990 | 5017 | 6562 | 7209 | 5418 | 4525 | 5454 |
| Sc45 | 5.0 | 5.5 | 5.6 | 5.4 | 5.5 | 5.7 | 5.5 | 5.1 | 5.5 | 5.3 |
| Ti47 | 727 | 830 | 651 | 727 | 823 | 801 | 985 | 813 | 760 | 748 |
| V51 | 7.2 | 9.2 | 4.9 | 6.5 | 9.5 | 8.5 | 13.2 | 9.1 | 8.7 | 8.5 |
| Rb85 | 342 | 344 | 351 | 381 | 367 | 342 | 343 | 357 | 415 | 333 |
| Sr88 | 61 | 82 | 57 | 72 | 72 | 70 | 127 | 79 | 57 | 86 |
| Y89 | 38 | 37 | 38 | 39 | 36 | 36 | 39 | 35 | 36 | 36 |
| Zr90 | 184 | 184 | 184 | 183 | 187 | 188 | 190 | 184 | 182 | 183 |
| Nb93 | 38 | 37 | 38 | 38 | 38 | 39 | 38 | 38 | 37 | 37 |
| Ba138 | 114 | 130 | 85 | 120 | 128 | 124 | 180 | 139 | 126 | 132 |
| La139 | 68 | 69 | 66 | 71 | 66 | 69 | 75 | 67 | 66 | 68 |
| Ce140 | 128.1 | 131.1 | 127.4 | 134.1 | 125.1 | 130.3 | 142.3 | 123.6 | 125.2 | 129.5 |
| Pr141 | 13 | 13 | 13 | 14 | 12 | 13 | 15 | 12 | 12 | 13 |
| Nd146 | 44 | 44 | 43 | 46 | 42 | 43 | 47 | 42 | 43 | 46 |
| Sm147 | 8.1 | 8.4 | 8.4 | 9.1 | 7.8 | 8.1 | 8.1 | 7.9 | 7.8 | 7.8 |
| Sm149 | 8.4 | 8.6 | 8.1 | 8.9 | 8.1 | 8.4 | 9.6 | 8.1 | 8.3 | 8.8 |
| Eu153 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.3 | 0.4 | 0.2 | 0.2 | 0.3 |
| Gd157 | 6.3 | 6.3 | 6.9 | 6.6 | 6.2 | 6.2 | 6.7 | 5.8 | 6.1 | 5.8 |
| Dy163 | 6.6 | 6.3 | 6.4 | 6.5 | 6.2 | 6.3 | 7.1 | 6.0 | 6.1 | 6.4 |
| Er166 | 4.1 | 3.9 | 4.0 | 4.1 | 4.0 | 3.9 | 4.1 | 3.9 | 3.9 | 3.9 |
| Yb172 | 4.4 | 4.3 | 4.4 | 4.5 | 4.3 | 4.4 | 4.4 | 4.3 | 4.3 | 4.4 |
| Lu175 | 0.7 | 0.6 | 0.7 | 0.6 | 0.6 | 0.7 | 0.6 | 0.6 | 0.7 | 0.6 |
| Ta181 | 2.6 | 2.6 | 2.8 | 2.7 | 2.7 | 2.7 | 2.5 | 2.6 | 2.5 | 2.5 |
| Pb208 | 35 | 34 | 33 | 36 | 35 | 33 | 34 | 36 | 35 | 33 |
| Th232 | 54 | 54 | 54 | 54 | 54 | 54 | 53 | 53 | 54 | 54 |
| U238 | 16.4 | 16.9 | 16.7 | 16.5 | 16.3 | 16.6 | 16.1 | 16.3 | 16.5 | 16.4 |
| **Eruptive Unit** | Commenda | Commenda | Commenda | Commenda | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S38e.12 | S38e.13 | S38e.14 | S38e.15 | GS3390-110. | GS3390-110. | S3390-110.3 | GS3390-110. | S3390-110.4 | GS3390-110.6 |
| Si29 | 359198 | 360258 | 361698 | 358616 | 303944 | 300848 | 300848 | 306381 | 306381 | 305037 |
| Ca43 | 5081 | 5759 | 5333 | 4588 | 16150 | 20688 | 19480 | 17354 | 16788 | 17002 |
| Sc45 | 5.4 | 5.4 | 5.3 | 5.7 | 15.8 | 14.6 | 15.9 | 15.6 | 15.4 | 22.3 |
| Ti47 | 716 | 732 | 764 | 743 | 2564 | 2678 | 2763 | 2847 | 2796 | 2488 |
| V51 | 6.8 | 7.3 | 8.3 | 8.1 | 43.0 | 60.2 | 58.9 | 44.0 | 44.5 | 39.9 |
| Rb85 | 342 | 354 | 344 | 407 | 250 | 247 | 247 | 268 | 265 | 202 |
| Sr88 | 67 | 85 | 78 | 56 | 581 | 901 | 889 | 647 | 608 | 521 |
| Y89 | 37 | 37 | 37 | 36 | 16 | 18 | 19 | 18 | 19 | 15 |
| Zr90 | 180 | 184 | 186 | 184 | 180 | 191 | 199 | 216 | 211 | 169 |
| Nb93 | 37 | 37 | 38 | 38 | 28 | 27 | 29 | 31 | 31 | 26 |
| Ba138 | 111 | 133 | 126 | 124 | 1063 | 2006 | 1949 | 1226 | 1075 | 887 |
| La139 | 68 | 67 | 68 | 67 | 56 | 61 | 64 | 59 | 62 | 47 |
| Ce140 | 129.7 | 127.8 | 128.4 | 126.7 | 98.2 | 105.9 | 107.8 | 104.4 | 108.0 | 88.7 |
| Pr141 | 12.8 | 12.6 | 13.0 | 12.5 | 9.2 | 10.4 | 10.8 | 10.3 | 10.5 | 8.2 |
| Nd146 | 45 | 42 | 44 | 42 | 34 | 36 | 37 | 36 | 37 | 29 |
| Sm147 | 8.2 | 8.1 | 7.6 | 7.8 | 7.7 | 7.1 | 6.6 | 7.5 | 6.4 | 8.0 |
| Sm149 | 8.4 | 8.5 | 8.1 | 8.0 | 8.2 | 7.4 | 6.7 | 6.4 | 7.4 | 7.9 |
| Eu153 | 0.2 | 0.2 | 0.2 | 0.2 | 1.3 | 1.3 | 1.3 | 1.3 | 1.2 | 1.6 |
| Gd157 | 6.4 | 6.1 | 6.5 | 6.1 | 6.3 | 5.1 | 5.9 | 4.6 | 5.1 | 5.1 |
| Dy163 | 6.4 | 6.3 | 6.1 | 6.0 | 3.2 | 3.5 | 3.5 | 3.2 | 3.2 | 2.7 |
| Er166 | 4.0 | 3.8 | 3.9 | 3.8 | 2.0 | 2.0 | 2.0 | 1.9 | 2.1 | 2.1 |
| Yb172 | 4.4 | 4.2 | 4.4 | 4.2 | 2.3 | 2.0 | 2.3 | 2.1 | 2.1 | 2.3 |
| Lu175 | 0.7 | 0.7 | 0.7 | 0.6 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.6 |
| Ta181 | 2.6 | 2.6 | 2.8 | 2.6 | 1.5 | 1.5 | 1.7 | 1.8 | 1.9 | 1.4 |
| Pb208 | 34 | 33 | 35 | 34 | 34 | 33 | 34 | 32 | 32 | 23 |
| Th232 | 53 | 54 | 54 | 53 | 28 | 29 | 30 | 31 | 33 | 23 |
| U238 | 16.3 | 16.4 | 16.5 | 16.4 | 9.0 | 9.4 | 10.4 | 10.0 | 10.5 | 7.9 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | GS3390-110. | GS3390-110. | S3390-110.9 | S3390-110.1 | S3390-110.1 | S3390-110.1 | S3390-110.1 | S3390-110.1 | S3390-110.1 | S3390-110.15 |
| Si29 | 299513 | 303587 | 303587 | 305203 | 297998 | 297998 | 304221 | 302489 | 302489 | 302489 |
| Ca43 | 20343 | 18051 | 17891 | 15402 | 20524 | 20822 | 17134 | 15420 | 22186 | 17202 |
| Sc45 | 15.9 | 15.2 | 16.1 | #DIV/0! | 16.1 | 16.1 | 16.5 | 16.6 | #DIV/0! | 15.3 |
| Ti47 | 2765 | 3059 | 3094 | 2132 | 2684 | 2647 | 2733 | 2591 | 2011 | 2722 |
| V51 | 71.4 | 49.5 | 50.3 | 32.2 | 71.5 | 71.3 | 46.7 | 45.6 | 38.8 | 43.5 |
| Rb85 | 233 | 254 | 260 | 175 | 242 | 238 | 253 | 253 | 246 | 255 |
| Sr88 | 1022 | 718 | 737 | 472 | 1003 | 993 | 636 | 628 | 479 | 610 |
| Y89 | 19 | 19 | 19 | 12 | 18 | 19 | 18 | 18 | 13 | 17 |
| Zr90 | 195 | 209 | 208 | 149 | 198 | 193 | 199 | 193 | 142 | 202 |
| Nb93 | 29 | 30 | 30 | 21 | 28 | 27 | 29 | 29 | 25 | 29 |
| Ba138 | 2549 | 1435 | 1463 | 911 | 2501 | 2420 | 1308 | 1281 | 1005 | 1146 |
| La139 | 62 | 60 | 62 | 42 | 61 | 60 | 58 | 55 | 42 | 57 |
| Ce140 | 111.2 | 107.7 | 108.4 | 72.0 | 108.0 | 106.4 | 102.3 | 97.3 | 78.4 | 102.7 |
| Pr141 | 10.8 | 10.7 | 11.0 | 6.6 | 10.8 | 10.8 | 9.8 | 9.5 | 7.5 | 10.3 |
| Nd146 | 40 | 36 | 40 | 27 | 39 | 37 | 34 | 33 | 27 | 34 |
| Sm147 | 6.1 | 6.5 | 6.5 | 7.9 | 7.0 | 8.0 | 8.1 | 6.5 | 9.1 | 6.7 |
| Sm149 | 6.4 | 6.9 | 7.0 | 10.0 | 7.1 | 7.1 | 7.4 | 6.6 | 7.6 | 7.1 |
| Eu153 | 1.5 | 1.5 | 1.3 | 1.5 | 1.4 | 1.6 | 1.3 | 1.2 | 1.3 | 1.3 |
| Gd157 | 6.0 | 5.0 | 5.5 | 5.7 | 4.5 | 6.0 | 5.6 | 5.3 | 9.9 | 5.0 |
| Dy163 | 4.1 | 3.3 | 3.8 | 2.9 | 3.3 | 3.6 | 3.7 | 3.3 | 3.0 | 3.0 |
| Er166 | 2.0 | 1.9 | 2.0 | 2.0 | 2.0 | 2.2 | 1.7 | 1.7 | 2.4 | 1.8 |
| Yb172 | 2.1 | 2.1 | 2.3 | 2.4 | 2.0 | 2.5 | 2.3 | 2.3 | 2.7 | 2.2 |
| Lu175 | 0.4 | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.6 | 0.4 |
| Ta181 | 1.6 | 1.6 | 1.8 | 1.7 | 1.8 | 1.6 | 1.8 | 1.6 | 1.3 | 1.7 |
| Pb208 | 28 | 30 | 32 | 20 | 29 | 29 | 34 | 31 | 39 | 35 |
| Th232 | 32 | 33 | 33 | 21 | 31 | 31 | 32 | 29 | 22 | 31 |
| U238 | 9.9 | 9.7 | 10.9 | 6.5 | 9.6 | 9.3 | 10.0 | 9.4 | 7.5 | 9.8 |

| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | S32b.1 | S32b.2 | S32b.4 | S32b.7 | S32b.8 | S32b.9 | R46-c4.g1 | R46-c3.g1 | R46-c1.g1 | GR46.1 |
| Si29 | 308209 | 293460 | 298024 | 308209 | 315970 | 308209 | 373214 | 373214 | 373214 | 351337 |
| Ca43 | 14963 | 16411 | 22562 | 27197 | 16535 | 13923 | 9609 | 11485 | 10740 | 5354 |
| Sc45 | 7 | 7 | 8 | 9 | 7 | 7 | 18 | #DIV/0! | #DIV/0! | 5 |
| Ti47 | 2269 | 2123 | 2745 | 2394 | 2393 | 2667 | 1586 | 1152 | 917 | 583 |
| V51 | 42.3 | 46.0 | 79.3 | 65.4 | 50.5 | 58.4 | 13.8 | 11.3 | 11.0 | 2.9 |
| Rb85 | 258 | 284 | 257 | 240 | 297 | 316 | 303 | 260 | 309 | 319 |
| Sr88 | 528 | 374 | 627 | 1217 | 465 | 213 | 85 | 167 | 162 | 35 |
| Y89 | 23 | 23 | 21 | 21 | 25 | 28 | 35 | 34 | 36 | 36 |
| Zr90 | 275 | 264 | 238 | 219 | 287 | 337 | 254 | 200 | 200 | 173 |
| Nb93 | 37 | 34 | 32 | 29 | 38 | 43 | 47 | 39 | 38 | 36 |
| Ba138 | 723 | 499 | 736 | 1835 | 683 | 285 | 152 | 228 | 167 | 53 |
| La139 | 73.4 | 79.8 | 73.0 | 63.5 | 83.8 | 90.2 | 126.9 | 88.4 | 65.8 | 67.3 |
| Ce140 | 131 | 141 | 130 | 114 | 150 | 164 | 214 | 155 | 126 | 125 |
| Pr141 | 12 | 13 | 13 | 11 | 14 | 16 | 19 | 15 | 12 | 12 |
| Nd146 | 42 | 45 | 44 | 39 | 48 | 54 | 71 | 54 | 45 | 42 |
| Sm147 | 7.1 | 7.2 | 7.4 | 7.3 | 7.6 | 8.7 | 13.1 | 11.2 | 9.1 | 7.1 |
| Sm149 | 7.0 | 6.7 | 7.4 | 7.0 | 8.1 | 8.7 | 11.7 | 11.5 | 8.9 | 10.0 |
| Eu153 | 1.0 | 0.9 | 1.1 | 1.3 | 1.0 | 0.8 | 0.9 | 1.0 | 0.9 | 0.2 |
| Gd157 | 4.8 | 4.8 | 5.3 | 4.7 | 5.3 | 5.7 | 8.2 | 8.2 | 7.8 | 6.3 |
| Dy163 | 4.0 | 4.1 | 4.1 | 4.1 | 4.5 | 5.0 | 6.2 | 6.3 | 5.6 | 6.1 |
| Er166 | 2.4 | 2.5 | 2.3 | 2.4 | 2.6 | 2.9 | 4.2 | 3.8 | 3.6 | 3.8 |
| Yb172 | 2.7 | 2.6 | 2.2 | 2.5 | 2.9 | 3.1 | 4.5 | 3.9 | 4.6 | 4.2 |
| Lu175 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.7 | 0.7 | 0.7 | 0.6 |
| Ta181 | 2.2 | 2.1 | 1.9 | 1.7 | 2.3 | 2.7 | 3.1 | 2.9 | 2.7 | 2.5 |
| Pb208 | 29 | 35 | 29 | 30 | 35 | 25 | 54 | 37 | 33 | 32 |
| Th232 | 48 | 46 | 41 | 38 | 50 | 57 | 76 | 63 | 57 | 53 |
| U238 | 14.7 | 14.2 | 12.8 | 11.0 | 15.3 | 17.4 | 21.1 | 19.3 | 17.4 | 16.3 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | GR46.3 | GR46.7 | GR46.7a | GR46.7b | GR46.14 | GR46.15 | S77b.3a | S77b.9 | S77b.9a | S77b.10 |
| Si29 | 358826 | 354502 | 354502 | 354502 | 355085 | 355085 | 286965 | 286099 | 286099 | 282776 |
| Ca43 | 10545 | 6638 | 5664 | 6050 | 6311 | 5654 | 29048 | 28776 | 28287 | 28917 |
| Sc45 | 6.0 | 5.6 | 5.5 | 5.7 | 5.7 | 5.5 | 14.5 | 14.5 | 15.7 | 14.3 |
| Ti47 | 1309 | 706 | 692 | 763 | 771 | 698 | 3343 | 3278 | 3387 | 3360 |
| V51 | 24.0 | 3.5 | 3.9 | 4.3 | 5.1 | 8.2 | 135.9 | 137.0 | 137.2 | 132.4 |
| Rb85 | 281 | 338 | 334 | 339 | 332 | 325 | 233 | 243 | 266 | 230 |
| Sr88 | 161 | 36 | 44 | 46 | 44 | 48 | 950 | 854 | 887 | 934 |
| Y89 | 39 | 26 | 32 | 35 | 37 | 31 | 20 | 20 | 21 | 21 |
| Zr90 | 203 | 151 | 176 | 187 | 201 | 172 | 195 | 193 | 202 | 199 |
| Nb93 | 38 | 34 | 36 | 37 | 38 | 37 | 29 | 28 | 28 | 28 |
| Ba138 | 245 | 78 | 88 | 94 | 81 | 79 | 1281 | 1206 | 1239 | 1283 |
| La139 | 80.4 | 76.2 | 80.8 | 88.6 | 78.8 | 67.1 | 71.1 | 70.4 | 72.4 | 72.2 |
| Ce140 | 149 | 141 | 144 | 158 | 145 | 124 | 128 | 128 | 134 | 131 |
| Pr141 | 15 | 12 | 14 | 15 | 14 | 12 | 13 | 13 | 13 | 13 |
| Nd146 | 51.7 | 39.6 | 44.4 | 49.2 | 47.4 | 40.7 | 46.6 | 44.2 | 46.1 | 46.2 |
| Sm147 | 9.3 | 7.5 | 7.3 | 8.0 | 8.7 | 7.4 | 8.4 | 9.4 | 8.3 | 8.1 |
| Sm149 | 9.3 | 7.9 | 7.8 | 8.4 | 8.9 | 6.9 | 9.0 | 8.3 | 9.0 | 8.2 |
| Eu153 | 0.6 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 1.6 | 1.8 | 1.5 | 1.4 |
| Gd157 | 6.6 | 4.9 | 6.2 | 6.4 | 6.8 | 4.8 | 6.3 | 6.2 | 6.5 | 6.1 |
| Dy163 | 6.5 | 4.4 | 5.4 | 5.8 | 6.5 | 5.3 | 3.8 | 3.8 | 3.8 | 4.3 |
| Er166 | 4.0 | 2.7 | 3.3 | 3.7 | 4.0 | 3.2 | 2.0 | 1.9 | 2.2 | 2.3 |
| Yb172 | 4.6 | 3.0 | 3.9 | 4.5 | 4.4 | 3.7 | 2.1 | 2.5 | 2.4 | 2.3 |
| Lu175 | 0.6 | 0.5 | 0.6 | 0.6 | 0.6 | 0.5 | 0.4 | 0.3 | 0.4 | 0.4 |
| Ta181 | 2.5 | 2.1 | 2.5 | 2.7 | 2.6 | 2.5 | 1.7 | 1.6 | 1.6 | 1.6 |
| Pb208 | 33 | 31 | 33 | 35 | 34 | 39 | 31 | 31 | 31 | 32 |
| Th232 | 58 | 45 | 57 | 61 | 58 | 48 | 32 | 33 | 33 | 33 |
| U238 | 16 | 17 | 18 | 19 | 18 | 15 | 11 | 10 | 10 | 10 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77tot.2 | S77tot.5 | S77tot.6 | S77tot.6a | S77tot.8 | S77e.2 | S77e.3 | S77e.4 | S77e.6 | S77i.5 |
| Si29 | 279035 | 282610 | 285052 | 285052 | 283864 | 280646 | 286819 | 288567 | 285183 | 283410 |
| Ca43 | 29660 | 26041 | 36658 | 40618 | 28898 | 33648 | 29576 | 9512 | 27814 | 170535 |
| Sc45 | 15.7 | 15.1 | 16.7 | 18.0 | 14.7 | 13.9 | 14.3 | 15.0 | 14.8 | 74.9 |
| Ti47 | 3451 | 3383 | 3714 | 3813 | 3510 | 3701 | 3626 | 3791 | 3464 | 4277 |
| V51 | 171.7 | 123.3 | 158.5 | 186.1 | 132.6 | 152.8 | 133.1 | 147.3 | 129.9 | 347.8 |
| Rb85 | 148 | 234 | 217 | 214 | 225 | 222 | 234 | 302 | 233 | #DIV/0! |
| Sr88 | 107 | 851 | 1141 | 1270 | 979 | 827 | 939 | 383 | 928 | 219 |
| Y89 | 19 | 18 | 19 | 20 | 19 | 21 | 20 | 20 | 19 | 37 |
| Zr90 | 178 | 189 | 183 | 174 | 191 | 190 | 198 | 195 | 192 | 93 |
| Nb93 | 25 | 28 | 26 | 25 | 28 | 27 | 29 | 29 | 28 | 1 |
| Ba138 | 177 | 1178 | 1238 | 1323 | 1272 | 1153 | 1287 | 988 | 1261 | 2 |
| La139 | 67.3 | 67.2 | 62.1 | 66.2 | 68.5 | 68.2 | 70.1 | 69.4 | 67.5 | 18.8 |
| Ce140 | 123 | 122 | 115 | 121 | 124 | 125 | 132 | 129 | 126 | 65 |
| Pr141 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 10 |
| Nd146 | 45 | 43 | 40 | 45 | 46 | 48 | 46 | 45 | 47 | 50 |
| Sm147 | 8.7 | 7.6 | 8.2 | 8.6 | 8.0 | 7.8 | 7.3 | 8.4 | 8.3 | 13.2 |
| Sm149 | 7.1 | 8.4 | 8.6 | 9.0 | 8.1 | 8.6 | 9.0 | 7.8 | 7.5 | 12.9 |
| Eu153 | 1.6 | 1.6 | 1.6 | 1.8 | 1.6 | 1.6 | 1.6 | 0.7 | 1.6 | 2.8 |
| Gd157 | 5.9 | 5.4 | 6.3 | 7.0 | 6.5 | 6.7 | 5.5 | 6.2 | 5.2 | 11.7 |
| Dy163 | 3.7 | 3.7 | 3.3 | 3.9 | 3.9 | 3.9 | 4.0 | 4.4 | 3.8 | 8.2 |
| Er166 | 2.0 | 1.9 | 2.0 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | 2.0 | 4.0 |
| Yb172 | 1.9 | 2.2 | 2.3 | 2.3 | 2.2 | 2.2 | 2.1 | 2.2 | 2.0 | 3.3 |
| Lu175 | 0.3 | 0.4 | 0.4 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Ta181 | 1.5 | 1.6 | 1.5 | 1.4 | 1.5 | 1.5 | 1.6 | 1.6 | 1.6 | #DIV/0! |
| Pb208 | 26 | 31 | 29 | 30 | 32 | 30 | 31 | 17 | 31 | #DIV/0! |
| Th232 | 30 | 31 | 29 | 29 | 31 | 32 | 33 | 33 | 32 | 1 |
| U238 | 9.0 | 10.0 | 8.6 | 9.1 | 9.8 | 9.3 | 10.0 | 9.7 | 9.9 | 0.4 |

Table E1: List of data produced through LA-ICP-MS for La Fossa glass samples.

| Eruptive Unit | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | AT2-c1.g1 | AT2-c1.g2 | AT2-c4.g1 | AT2-c5.g1 | AT2-c6.i1 | GAT2.1 | GAT2.1a | GAT2.1b | GAT2.4 | GAT2.5 |
| Si29 | 316544 | 316544 | 315580 | 314367 | 317442 | 301524 | 301524 | 301524 | 300822 | 299769 |
| Ca43 | 19041 | 22625 | 19561 | 23151 | 52322 | 20312 | 21190 | 20567 | 19799 | 20621 |
| Sc45 | 14 | 15 | 17 | #DIV/0! | 25 | 7 | 7 | 7 | 7 | 7 |
| Ti47 | 3933 | 5098 | 4933 | 3740 | 4121 | 2887 | 2929 | 2953 | 3095 | 3235 |
| V51 | 88.4 | 88.8 | 87.9 | 87.4 | 142.4 | 76.8 | 79.4 | 78.8 | 83.3 | 84.9 |
| Rb85 | 303 | 298 | 297 | 289 | 232 | 277 | 271 | 267 | 279 | 288 |
| Sr88 | 642 | 653 | 596 | 597 | 597 | 614 | 649 | 640 | 507 | 391 |
| Y89 | 24 | 26 | 23 | 28 | 32 | 22 | 22 | 23 | 23 | 26 |
| Zr90 | 275 | 266 | 263 | 274 | 266 | 237 | 243 | 243 | 252 | 262 |
| Nb93 | 36 | 34 | 36 | 36 | 30 | 33 | 33 | 33 | 34 | 36 |
| Ba138 | 990 | 971 | 862 | 875 | 882 | 924 | 975 | 945 | 726 | 523 |
| La139 | 76.4 | 84.4 | 76.1 | 88.2 | 78.0 | 72.4 | 72.8 | 72.8 | 75.2 | 81.0 |
| Ce140 | 138 | 155 | 138 | 154 | 138 | 128 | 129 | 129 | 133 | 144 |
| Pr141 | 13.1 | 16.1 | 13.3 | 15.5 | 15.5 | 12.4 | 12.6 | 12.7 | 13.2 | 14.6 |
| Nd146 | 44 | 54 | 47 | 57 | 60 | 42 | 42 | 43 | 45 | 50 |
| Sm147 | 9.4 | 9.6 | 8.3 | 9.8 | 11.2 | 7.3 | 7.5 | 7.9 | 7.0 | 8.3 |
| Sm149 | 7.2 | 8.8 | 9.1 | 8.1 | 11.5 | 7.1 | 7.3 | 7.1 | 7.2 | 8.4 |
| Eu153 | 1.1 | 1.6 | 1.3 | 1.6 | 1.6 | 1.1 | 1.2 | 1.2 | 1.1 | 1.2 |
| Gd157 | 6.1 | 6.2 | 7.7 | 8.0 | 8.6 | 4.8 | 5.0 | 5.0 | 5.1 | 5.7 |
| Dy163 | 3.5 | 4.8 | 4.5 | 5.0 | 6.9 | 4.1 | 4.2 | 4.0 | 4.0 | 4.6 |
| Er166 | 2.7 | 2.5 | 2.4 | 3.2 | 3.8 | 2.2 | 2.3 | 2.4 | 2.3 | 2.6 |
| Yb172 | 3.0 | 3.2 | 3.0 | 3.1 | 3.5 | 2.4 | 2.5 | 2.6 | 2.5 | 2.6 |
| Lu175 | 0.5 | 0.5 | 0.6 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Ta181 | 2.1 | 2.1 | 2.3 | 2.2 | 1.8 | 1.9 | 2.0 | 1.9 | 2.0 | 2.1 |
| Pb208 | 38 | 37 | 35 | 38 | 31 | 36 | 33 | 32 | 34 | 33 |
| Th232 | 46 | 46 | 44 | 49 | 38 | 40 | 41 | 41 | 43 | 44 |
| U238 | 13 | 14 | 14 | 15 | 12 | 13 | 13 | 13 | 13 | 14 |

| Eruptive Unit | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello | Vulcanello |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | GAT2.6 | GAT2.6a | GAT2.8 | GAT2.10 | GAT2.10a | GAT2.12a | GAT2.12b | GAT2.13 | GAT2.13a | GAT2.14a |
| Si29 | 300517 | 300517 | 299844 | 300078 | 300078 | 299576 | 299576 | 300544 | 300544 | 300398 |
| Ca43 | 20734 | 19942 | 21251 | 19736 | 21211 | 20085 | 21628 | 20863 | 33010 | 23012 |
| Sc45 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 12 | 7 |
| Ti47 | 3037 | 3061 | 2994 | 3139 | 3101 | 3168 | 3168 | 3142 | 3375 | 3074 |
| V51 | 82.3 | 81.3 | 81.3 | 86.4 | 85.8 | 83.0 | 86.5 | 83.0 | 113.5 | 81.3 |
| Rb85 | 282 | 286 | 285 | 292 | 286 | 284 | 278 | 289 | 260 | 281 |
| Sr88 | 571 | 505 | 554 | 466 | 515 | 484 | 536 | 425 | 574 | 638 |
| Y89 | 23 | 23 | 24 | 23 | 24 | 23 | 25 | 24 | 26 | 25 |
| Zr90 | 250 | 248 | 242 | 253 | 250 | 256 | 253 | 263 | 248 | 246 |
| Nb93 | 34 | 34 | 33 | 35 | 34 | 35 | 34 | 35 | 31 | 33 |
| Ba138 | 836 | 730 | 784 | 640 | 715 | 662 | 734 | 546 | 757 | 913 |
| La139 | 74.6 | 75.2 | 78.1 | 77.2 | 79.8 | 77.7 | 80.4 | 81.2 | 72.1 | 80.0 |
| Ce140 | 133 | 133 | 138 | 135 | 141 | 138 | 147 | 148 | 133 | 145 |
| Pr141 | 12.9 | 13.1 | 13.5 | 13.1 | 13.6 | 13.3 | 14.3 | 14.0 | 13.5 | 13.9 |
| Nd146 | 45 | 43 | 46 | 46 | 47 | 47 | 51 | 50 | 50 | 51 |
| Sm147 | 7.5 | 7.7 | 7.7 | 7.4 | 7.7 | 7.3 | 8.5 | 8.3 | 7.9 | 8.4 |
| Sm149 | 7.5 | 7.4 | 8.1 | 7.6 | 8.7 | 7.9 | 8.2 | 8.2 | 8.8 | 8.4 |
| Eu153 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.2 | 1.1 | 1.4 | 1.3 |
| Gd157 | 5.0 | 5.0 | 5.0 | 5.4 | 5.6 | 5.2 | 5.9 | 5.5 | 6.2 | 6.1 |
| Dy163 | 4.1 | 4.2 | 4.3 | 4.1 | 4.4 | 4.3 | 4.6 | 4.5 | 5.0 | 4.6 |
| Er166 | 2.4 | 2.3 | 2.5 | 2.5 | 2.5 | 2.4 | 2.6 | 2.6 | 2.7 | 2.6 |
| Yb172 | 2.6 | 2.3 | 2.5 | 2.6 | 2.6 | 2.7 | 2.5 | 2.7 | 2.9 | 2.8 |
| Lu175 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Ta181 | 2.0 | 2.1 | 1.9 | 2.0 | 1.9 | 2.1 | 2.0 | 2.0 | 1.7 | 2.0 |
| Pb208 | 32 | 33 | 31 | 33 | 32 | 35 | 33 | 34 | 31 | 32 |
| Th232 | 42 | 42 | 41 | 42 | 42 | 44 | 43 | 45 | 39 | 42 |
| U238 | 13.3 | 12.8 | 12.7 | 13.4 | 13.1 | 13.4 | 13.4 | 13.8 | 11.9 | 13.1 |

| Eruptive Unit | Vulcanello II | Vulcanello II | Vulcanello II | Vulcanello II | Vulcanello II | Vulcanello II | Vulcanello II | Vulcanello II | Vulcanello II | Vulcanello II |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | GAT3.1 | GAT3.2 | GAT3.3 | GAT3.4 | GAT3.4a | GAT3.5 | GAT3.6 | GAT3.7a | GAT3.9 | GAT3.10 |
| Si29 | 278310 | 277534 | 279362 | 277343 | 277343 | 278531 | 276195 | 277202 | 274901 | 276935 |
| Ca43 | 35108 | 33461 | 38062 | 38568 | 39408 | 34756 | 38822 | 38221 | 40059 | 35063 |
| Sc45 | 16 | 21 | 16 | 15 | 16 | 16 | 16 | 16 | 17 | 16 |
| Ti47 | 3527 | 3661 | 3721 | 3610 | 3616 | 3714 | 3553 | 3638 | 2951 | 3446 |
| V51 | 151.7 | 143.0 | 157.7 | 163.0 | 162.2 | 152.1 | 157.5 | 160.8 | 159.1 | 156.6 |
| Rb85 | 226 | 210 | 227 | 216 | 217 | 227 | 216 | 221 | 218 | 220 |
| Sr88 | 1039 | 985 | 1077 | 1091 | 1114 | 994 | 1077 | 1096 | 1101 | 1097 |
| Y89 | 18 | 19 | 19 | 18 | 18 | 19 | 20 | 19 | 20 | 19 |
| Zr90 | 176 | 156 | 175 | 168 | 170 | 175 | 169 | 174 | 180 | 177 |
| Nb93 | 27 | 24 | 27 | 26 | 25 | 25 | 26 | 25 | 25 | 27 |
| Ba138 | 1224 | 1195 | 1245 | 1204 | 1220 | 1160 | 1209 | 1237 | 1221 | 1272 |
| La139 | 65.8 | 62.8 | 65.1 | 64.7 | 66.7 | 59.9 | 65.9 | 65.9 | 65.2 | 66.8 |
| Ce140 | 119 | 107 | 122 | 118 | 118 | 111 | 116 | 122 | 122 | 122 |
| Pr141 | 11.9 | 11.2 | 11.6 | 11.7 | 12.1 | 11.2 | 12.0 | 12.7 | 12.7 | 12.4 |
| Nd146 | 45 | 41 | 48 | 44 | 43 | 44 | 43 | 43 | 48 | 46 |
| Sm147 | 8.4 | 9.1 | 7.8 | 7.9 | 8.1 | 7.4 | 8.1 | 8.0 | 8.5 | 7.6 |
| Sm149 | 8.2 | 10.4 | 9.2 | 7.7 | 7.1 | 7.6 | 8.1 | 7.7 | 8.5 | 8.7 |
| Eu153 | 1.5 | 1.3 | 1.5 | 1.8 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 |
| Gd157 | 5.2 | 7.4 | 5.8 | 5.5 | 6.4 | 5.7 | 5.0 | 6.8 | 6.0 | 5.2 |
| Dy163 | 3.6 | 3.8 | 3.8 | 3.9 | 3.5 | 3.8 | 3.7 | 3.9 | 3.3 | 3.6 |
| Er166 | 2.5 | 2.0 | 2.0 | 2.0 | 1.9 | 2.2 | 1.9 | 1.8 | 1.9 | 2.0 |
| Yb172 | 1.8 | 2.3 | 2.2 | 2.2 | 1.8 | 2.3 | 1.9 | 2.0 | 1.7 | 2.0 |
| Lu175 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.3 |
| Ta181 | 1.5 | 1.3 | 1.3 | 1.3 | 1.3 | 1.4 | 1.5 | 1.5 | 1.4 | 1.4 |
| Pb208 | 29 | 27 | 30 | 30 | 29 | 30 | 30 | 30 | 28 | 29 |
| Th232 | 29 | 27 | 29 | 28 | 29 | 29 | 28 | 29 | 29 | 29 |
| U238 | 9.6 | 9.1 | 9.3 | 8.7 | 9.1 | 9.2 | 8.9 | 9.2 | 8.5 | 9.1 |

| Eruptive Unit | Vulcanello II | Vulcanello II | Vulcanello II | Vulcanello II | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | GAT3.12 | GAT3.13a | GAT3.14 | GAT3.14a | AT8.c1.i2 | AT8.c1.i3 | AT8.c2.i1 | AT8.c2.i2 | AT8.c3.g1 | AT8.c5.i1 |
| Si29 | 278078 | 276165 | 277650 | 277650 | 290131 | 290131 | 290131 | 290131 | 292542 | 290131 |
| Ca43 | 38122 | 36782 | 35738 | 35983 | 28997 | 28108 | 28194 | 27443 | 37363 | 27001 |
| Sc45 | 17.3 | 15.6 | 15.5 | 15.2 | 12.4 | 11.5 | 12.1 | 14.5 | 19.6 | 15.7 |
| Ti47 | 3468 | 3130 | 3351 | 3396 | 3725 | 4016 | 3920 | 3618 | 3803 | 3424 |
| V51 | 156.0 | 158.3 | 153.4 | 154.1 | 139.9 | 144.4 | 138.1 | 133.7 | 139.7 | 120.9 |
| Rb85 | 218 | 213 | 221 | 220 | 261 | 292 | 254 | 253 | 179 | 260 |
| Sr88 | 1088 | 1081 | 1079 | 1082 | 976 | 907 | 982 | 1012 | 1008 | 1028 |
| Y89 | 20 | 19 | 18 | 19 | 21 | 28 | 21 | 18 | 23 | 18 |
| Zr90 | 179 | 171 | 178 | 175 | 217 | 212 | 212 | 158 | 218 | 193 |
| Nb93 | 27 | 24 | 25 | 25 | 30 | 36 | 33 | 25 | 33 | 28 |
| Ba138 | 1255 | 1220 | 1265 | 1250 | 1489 | 1111 | 1361 | 1386 | 1401 | 1333 |
| La139 | 65.0 | 62.9 | 65.3 | 64.1 | 73.7 | 82.1 | 75.0 | 64.0 | 77.1 | 65.0 |
| Ce140 | 121 | 120 | 121 | 121 | 141 | 158 | 142 | 117 | 143 | 119 |
| Pr141 | 12.2 | 12.1 | 12.0 | 11.9 | 14.0 | 15.7 | 13.8 | 11.6 | 13.7 | 11.6 |
| Nd146 | 48.7 | 46.9 | 48.3 | 46.7 | 53.3 | 60.3 | 52.0 | 42.8 | 55.6 | 44.6 |
| Sm147 | 7.6 | 8.0 | 7.7 | 6.8 | 7.4 | 8.5 | 10.2 | 7.6 | 9.9 | 9.3 |
| Sm149 | 7.6 | 8.1 | 7.9 | 8.4 | 7.9 | 10.0 | 8.6 | 8.9 | 11.4 | 9.3 |
| Eu153 | 1.5 | 1.7 | 1.6 | 1.7 | 1.9 | 1.6 | 1.6 | 1.6 | 1.9 | 1.8 |
| Gd157 | 5.9 | 5.9 | 5.8 | 5.5 | 6.2 | 6.7 | 6.4 | 5.6 | 6.4 | 6.0 |
| Dy163 | 3.8 | 3.5 | 3.8 | 3.7 | 4.4 | 5.3 | 4.3 | 4.0 | 4.8 | 4.0 |
| Er166 | 2.0 | 1.8 | 2.0 | 1.9 | 2.5 | 3.3 | 2.2 | 1.9 | 2.2 | 2.1 |
| Yb172 | 2.0 | 2.3 | 2.1 | 2.1 | 2.3 | 3.1 | 2.9 | 2.4 | 2.5 | 2.7 |
| Lu175 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 | 0.4 | 0.4 | 0.5 | 0.5 |
| Ta181 | 1.3 | 1.5 | 1.5 | 1.4 | 1.9 | 1.8 | 1.7 | 1.4 | 1.9 | 1.8 |
| Pb208 | 30 | 30 | 29 | 30 | 33 | 39 | 35 | 34 | 37 | 38 |
| Th232 | 29 | 28 | 29 | 29 | 36 | 39 | 36 | 27 | 38 | 33 |
| U238 | 9.5 | 9.2 | 9.0 | 8.9 | 9.9 | 12.8 | 11.8 | 8.8 | 11.5 | 10.5 |

| Eruptive Unit | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | AT8.c5.i2 | GAT8.1.i1 | GAT8.2.g1 | GAT8.3.i1 | GAT8.4.g1 | GAT8.10.g2 | GAT8.9.g1 | GAT8.7.g1 | GAT8.6.g1 | GAT8.13.g1 |
| Si29 | 290131 | 290131 | 290131 | 290131 | 290131 | 290131 | 290131 | 290131 | 290131 | 290131 |
| Ca43 | 30538 | 27453 | 121697 | 27359 | 30551 | 33420 | 30959 | 65537 | 31233 | 52215 |
| Sc45 | 15 | 16 | 49 | 14 | 16 | 15 | #DIV/0! | 28 | #DIV/0! | 24 |
| Ti47 | 3944 | 4758 | 4553 | 3513 | 3590 | 4527 | 4114 | 4777 | 4115 | 4567 |
| V51 | 134.6 | 221.7 | 250.3 | 103.2 | 142.8 | 190.4 | 129.3 | 198.9 | 133.1 | 163.4 |
| Rb85 | 258 | 248 | 88 | 274 | 230 | 218 | 197 | 177 | 198 | 175 |
| Sr88 | 960 | 1533 | 489 | 975 | 1048 | 1338 | 1058 | 1029 | 1197 | 958 |
| Y89 | 30 | 19 | 39 | 18 | 19 | 22 | 21 | 28 | 18 | 26 |
| Zr90 | 227 | 198 | 188 | 220 | 196 | 198 | 218 | 212 | 210 | 221 |
| Nb93 | 38 | 29 | 13 | 31 | 31 | 32 | 33 | 24 | 31 | 31 |
| Ba138 | 1196 | 1547 | 503 | 1364 | 1396 | 1627 | 1414 | 1154 | 1463 | 1217 |
| La139 | 81.5 | 76.2 | 57.8 | 73.6 | 75.2 | 88.5 | 87.7 | 72.9 | 76.6 | 77.8 |
| Ce140 | 161 | 133 | 137 | 135 | 136 | 157 | 155 | 137 | 140 | 141 |
| Pr141 | 15 | 12 | 16 | 13 | 13 | 15 | 15 | 14 | 13 | 14 |
| Nd146 | 59 | 53 | 75 | 45 | 47 | 58 | 53 | 59 | 46 | 59 |
| Sm147 | 12.3 | 7.0 | 18.8 | 8.8 | 8.5 | 9.8 | 9.5 | 11.3 | 9.9 | 9.8 |
| Sm149 | 12.1 | 6.8 | 16.3 | 8.0 | 8.8 | 9.1 | 11.3 | 9.7 | 8.6 | 9.2 |
| Eu153 | 1.7 | 1.7 | 3.0 | 1.6 | 1.7 | 2.0 | 2.0 | 2.3 | 1.7 | 1.9 |
| Gd157 | 7.3 | 4.9 | 12.1 | 6.9 | 6.3 | 6.3 | 7.1 | 6.8 | 5.9 | 8.2 |
| Dy163 | 5.8 | 3.4 | 8.5 | 3.6 | 4.0 | 4.0 | 4.3 | 5.9 | 4.1 | 4.7 |
| Er166 | 3.0 | 2.2 | 3.6 | 1.8 | 2.2 | 2.5 | 2.6 | 2.9 | 2.1 | 2.8 |
| Yb172 | 3.0 | 1.9 | 4.2 | 2.5 | 2.4 | 2.4 | 3.1 | 2.9 | 2.4 | 2.6 |
| Lu175 | 0.6 | 0.4 | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 |
| Ta181 | 2.1 | 1.3 | 1.0 | 1.9 | 1.7 | 1.8 | 1.9 | 1.4 | 1.8 | 2.0 |
| Pb208 | 38 | 31 | 18 | 35 | 38 | 43 | 37 | 29 | 36 | 32 |
| Th232 | 42 | 31 | 15 | 39 | 35 | 36 | 37 | 30 | 35 | 34 |
| U238 | 13.1 | 9.1 | 4.4 | 11.4 | 11.2 | 11.7 | 12.2 | 8.8 | 11.9 | 10.8 |

| Eruptive Unit | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | AT6c1.g1 | AT6.c2.g1 | AT6.c2.i2 | AT6.c3.g1 | AT6.c4.i1 | AT6.c5.g1 | AT6.c5.i1 | AT6.c6.g1 | AT6.c6.i1 | AT6.c7.g1 |
| Si29 | 290423 | 289996 | 289025 | 288204 | 289025 | 287608 | 289025 | 290746 | 289025 | 285199 |
| Ca43 | 31427 | 32239 | 21970 | 36497 | 35183 | 28714 | 25506 | 31464 | 22187 | 30716 |
| Sc45 | 15 | 14 | 13 | 16 | 17 | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! |
| Ti47 | 5121 | 5011 | 4233 | 5058 | 6133 | 3859 | 3830 | 4078 | 3705 | 3873 |
| V51 | 156.0 | 152.0 | 119.0 | 159.2 | 150.9 | 143.1 | 125.9 | 141.9 | 127.6 | 154.9 |
| Rb85 | 239 | 248 | 220 | 242 | 265 | 240 | 243 | 240 | 350 | 236 |
| Sr88 | 1036 | 1069 | 542 | 1123 | 797 | 973 | 879 | 947 | 544 | 997 |
| Y89 | 21 | 22 | 24 | 22 | 21 | 18 | 17 | 17 | 15 | 16 |
| Zr90 | 212 | 217 | 191 | 208 | 179 | 179 | 182 | 180 | 163 | 181 |
| Nb93 | 32 | 31 | 31 | 30 | 29 | 28 | 30 | 27 | 28 | 27 |
| Ba138 | 1397 | 1430 | 1138 | 1434 | 1361 | 1274 | 1262 | 1255 | 1035 | 1267 |
| La139 | 77.1 | 80.3 | 68.4 | 79.8 | 62.7 | 67.7 | 68.9 | 70.3 | 60.2 | 69.1 |
| Ce140 | 140 | 143 | 121 | 141 | 120 | 126 | 125 | 124 | 110 | 122 |
| Pr141 | 13.6 | 13.9 | 12.0 | 13.6 | 11.2 | 12.1 | 13.0 | 11.6 | 9.8 | 11.1 |
| Nd146 | 49.1 | 51.5 | 43.3 | 49.5 | 44.2 | 45.9 | 41.5 | 49.7 | 40.6 | 44.6 |
| Sm147 | 8.3 | 10.3 | 8.1 | 9.8 | 9.3 | 11.7 | 11.9 | 10.7 | 11.6 | 12.1 |
| Sm149 | 10.2 | 10.1 | 8.8 | 9.5 | 7.2 | 12.1 | 14.5 | 18.4 | 11.6 | 18.6 |
| Eu153 | 1.8 | 1.9 | 1.3 | 1.8 | 1.5 | 2.1 | 2.0 | 2.1 | 2.0 | 2.2 |
| Gd157 | 6.6 | 6.8 | 6.1 | 7.5 | 5.4 | 8.7 | 9.3 | 11.1 | 10.7 | 10.9 |
| Dy163 | 4.3 | 4.1 | 4.1 | 4.2 | 4.2 | 4.6 | 5.2 | 4.5 | 5.6 | 5.4 |
| Er166 | 2.1 | 2.1 | 2.4 | 2.3 | 2.1 | 2.4 | 2.9 | 2.7 | 3.0 | 2.9 |
| Yb172 | 2.5 | 2.3 | 3.2 | 2.2 | 2.2 | 3.8 | 3.7 | 3.0 | 4.9 | 6.6 |
| Lu175 | 0.5 | 0.4 | 0.5 | 0.5 | 0.4 | 1.1 | 0.7 | 0.7 | 0.8 | #DIV/0! |
| Ta181 | 1.9 | 2.0 | 1.7 | 1.8 | 1.7 | 1.8 | 1.9 | 1.8 | 1.9 | 1.8 |
| Pb208 | 34 | 34 | 32 | 33 | 29 | 33 | 32 | 34 | 29 | 34 |
| Th232 | 34 | 35 | 36 | 34 | 30 | 30 | 29 | 29 | 25 | 28 |
| U238 | 10.8 | 11.0 | 10.9 | 11.1 | 9.5 | 9.5 | 9.9 | 9.6 | 9.5 | 10.2 |

| Eruptive Unit | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I |
|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | AT6.c7.i2 | AT6.c8.g1 | GAT6.1.g1 | GAT6.2.g1 | GAT6.3.g1 | GAT6.4.g1 | GAT6.5.g1 | GAT6.5.i1 | GAT6.6.g1 | GAT6.7.g1 |
| **Si29** | 289025 | 289208 | 289025 | 289025 | 289025 | 289025 | 289025 | 289025 | 289025 | 289025 |
| **Ca43** | 31048 | 35018 | 26408 | 28661 | 32285 | 32019 | 30033 | 155261 | 29132 | 39712 |
| **Sc45** | #DIV/0! | 24.0 | #DIV/0! | 22.4 | #DIV/0! | #DIV/0! | 23.0 | 74.3 | #DIV/0! | #DIV/0! |
| **Ti47** | 4114 | 4158 | 3296 | 4596 | 4559 | 4668 | 4614 | 4693 | 3571 | 4845 |
| **V51** | 167.5 | 176.4 | 139.8 | 153.6 | 160.1 | 158.7 | 159.8 | 289.3 | 134.2 | 191.2 |
| **Rb85** | 224 | 231 | 234 | 237 | 230 | 238 | 234 | 35 | 244 | 210 |
| **Sr88** | 1063 | 1095 | 856 | 973 | 1030 | 1010 | 1026 | 339 | 986 | 1173 |
| **Y89** | 20 | 19 | 17 | 18 | 19 | 18 | 18 | 30 | 21 | 18 |
| **Zr90** | 170 | 178 | 183 | 183 | 178 | 183 | 179 | 81 | 185 | 169 |
| **Nb93** | 28 | 29 | 28 | 28 | 28 | 26 | 28 | 5 | 30 | 25 |
| **Ba138** | 1339 | 1307 | 1198 | 1252 | 1256 | 1278 | 1248 | 170 | 1355 | 1310 |
| **La139** | 68 | 70 | 67 | 68 | 66 | 72 | 67 | 27 | 73 | 64 |
| **Ce140** | 125.6 | 125.7 | 121.6 | 121.1 | 119.8 | 126.0 | 120.4 | 68.2 | 136.3 | 118.5 |
| **Pr141** | 12 | 12 | 11 | 11 | 13 | 13 | 11 | 10 | 14 | 12 |
| **Nd146** | 46 | 49 | 43 | 41 | 40 | 48 | 46 | 48 | 47 | 42 |
| **Sm147** | 10.5 | 11.3 | 12.7 | 10.6 | 12.8 | 11.4 | 10.3 | 14.2 | 11.4 | 13.8 |
| **Sm149** | 15.3 | 17.3 | 16.1 | 14.6 | 13.3 | 14.3 | 15.8 | 15.4 | 15.3 | 19.2 |
| **Eu153** | 2.1 | 2.1 | 2.7 | 2.2 | 2.5 | 2.0 | 1.9 | 2.9 | 2.1 | 2.7 |
| **Gd157** | 9.5 | 9.0 | 11.1 | 9.6 | 10.2 | 8.6 | 6.9 | 11.8 | 10.7 | 11.6 |
| **Dy163** | 5.2 | 4.4 | 5.5 | 4.9 | 4.7 | 5.3 | 4.7 | 6.5 | 4.5 | 6.6 |
| **Er166** | 3.2 | 2.8 | 2.7 | 3.6 | 3.0 | 3.2 | 2.6 | 3.7 | 2.6 | 2.9 |
| **Yb172** | 4.0 | 4.4 | 3.9 | 4.0 | 4.0 | 4.7 | 3.7 | 3.0 | 4.3 | 4.5 |
| **Lu175** | 0.9 | 0.8 | 0.9 | 0.8 | 0.8 | 0.9 | 0.6 | 0.8 | 1.0 | #DIV/0! |
| **Ta181** | 1.7 | 2.0 | 1.9 | 1.8 | 1.7 | 1.9 | 1.9 | 0.6 | 1.6 | 2.0 |
| **Pb208** | 33 | 34 | 29 | 32 | 29 | 32 | 32 | 8 | 35 | 33 |
| **Th232** | 28 | 30 | 29 | 29 | 29 | 30 | 30 | 5 | 32 | 26 |
| **U238** | 9.4 | 8.6 | 9.6 | 10.1 | 9.4 | 10.7 | 10.0 | 2.1 | 10.3 | 8.8 |

| Eruptive Unit | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I |
|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | GAT6.8.g1 | GAT6.9.g1 | GAT6.10.1 | GAT4.1 | GAT4.2 | GAT4.2a | GAT4.3 | GAT4.4 | GAT4.5 | GAT4.6 |
| **Si29** | 289025 | 289025 | 289025 | 275913 | 274468 | 274468 | 274070 | 272912 | 274956 | 272882 |
| **Ca43** | 31444 | 30023 | 27348 | 40634 | 42014 | 39551 | 40643 | 42791 | 40158 | 41408 |
| **Sc45** | #DIV/0! | #DIV/0! | #DIV/0! | 18.1 | 17.3 | 17.9 | 18.5 | 18.5 | 18.0 | 17.5 |
| **Ti47** | 4502 | 4627 | 4534 | 3483 | 3767 | 3904 | 3827 | 3821 | 3729 | 3727 |
| **V51** | 163.3 | 142.6 | 146.7 | 179.2 | 176.4 | 179.3 | 184.7 | 181.7 | 177.5 | 177.1 |
| **Rb85** | 239 | 244 | 251 | 211 | 213 | 221 | 219 | 219 | 215 | 209 |
| **Sr88** | 1031 | 939 | 941 | 1165 | 1220 | 1233 | 1187 | 1208 | 1178 | 1201 |
| **Y89** | 17 | 19 | 18 | 20 | 19 | 19 | 19 | 19 | 19 | 19 |
| **Zr90** | 173 | 185 | 191 | 161 | 167 | 179 | 171 | 173 | 169 | 165 |
| **Nb93** | 29 | 30 | 29 | 23 | 25 | 25 | 25 | 24 | 24 | 24 |
| **Ba138** | 1272 | 1289 | 1288 | 1227 | 1288 | 1304 | 1271 | 1267 | 1230 | 1260 |
| **La139** | 68 | 70 | 71 | 65 | 66 | 66 | 66 | 66 | 64 | 64 |
| **Ce140** | 123.3 | 122.4 | 128.1 | 117.9 | 119.1 | 124.4 | 119.7 | 124.2 | 117.4 | 119.1 |
| **Pr141** | 12.2 | 11.7 | 12.4 | 11.9 | 12.1 | 11.9 | 12.0 | 12.4 | 11.9 | 12.3 |
| **Nd146** | 47 | 46 | 48 | 46 | 45 | 42 | 45 | 44 | 42 | 43 |
| **Sm147** | 12.6 | 11.0 | 14.3 | 8.8 | 8.2 | 8.6 | 8.2 | 8.6 | 8.0 | 7.6 |
| **Sm149** | 15.5 | 14.5 | 16.9 | 8.0 | 8.2 | 8.8 | 7.2 | 7.8 | 8.1 | 7.9 |
| **Eu153** | 2.5 | 2.2 | 2.2 | 1.6 | 1.8 | 1.8 | 1.6 | 1.7 | 1.6 | 1.5 |
| **Gd157** | 11.3 | 11.1 | 9.1 | 7.0 | 6.5 | 6.7 | 6.0 | 7.1 | 6.0 | 6.6 |
| **Dy163** | 4.9 | 4.7 | 5.6 | 3.6 | 3.9 | 4.0 | 3.9 | 4.0 | 3.7 | 3.8 |
| **Er166** | 3.7 | 2.4 | 2.4 | 1.8 | 2.2 | 2.1 | 2.2 | 2.2 | 1.9 | 1.9 |
| **Yb172** | 4.4 | 3.7 | 3.5 | 1.9 | 2.2 | 2.1 | 2.3 | 2.3 | 1.8 | 1.9 |
| **Lu175** | 0.8 | 0.6 | 0.7 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.4 |
| **Ta181** | 2.0 | 1.9 | 1.9 | 1.3 | 1.4 | 1.6 | 1.5 | 1.5 | 1.3 | 1.4 |
| **Pb208** | 35 | 34 | 33 | 27 | 29 | 29 | 28 | 28 | 27 | 28 |
| **Th232** | 30 | 31 | 31 | 27 | 29 | 29 | 29 | 28 | 28 | 27 |
| **U238** | 10.1 | 11.0 | 11.0 | 8.5 | 8.9 | 9.1 | 8.9 | 8.9 | 8.9 | 8.4 |

| Eruptive Unit | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I | Vulcanello I |
|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | GAT4.6a | GAT4.6i1 | GAT4.7 | GAT4.8 | GAT4.9 | GAT4.10 | GAT4.11a | GAT4.12 | GAT4.13 | GAT4.13a |
| **Si29** | 272882 | 274342 | 273305 | 276875 | 272640 | 274568 | 273234 | 275847 | 274256 | 274256 |
| **Ca43** | 41556 | 31400 | 38473 | 46633 | 40275 | 42866 | 40972 | 40013 | 40841 | 42633 |
| **Sc45** | 17.9 | 17.5 | 19.0 | 18.2 | 18.7 | 19.8 | 17.9 | 21.0 | 18.2 | 17.2 |
| **Ti47** | 3772 | 3500 | 3276 | 3745 | 3633 | 3601 | 3530 | 3507 | 3554 | 3654 |
| **V51** | 176.1 | 140.3 | 192.8 | 187.1 | 179.1 | 183.9 | 181.4 | 173.9 | 181.9 | 180.3 |
| **Rb85** | 210 | 219 | 227 | 217 | 221 | 210 | 213 | 203 | 216 | 212 |
| **Sr88** | 1228 | 908 | 1158 | 1264 | 1217 | 1238 | 1226 | 1210 | 1240 | 1251 |
| **Y89** | 20 | 19 | 18 | 21 | 20 | 20 | 19 | 18 | 19 | 20 |
| **Zr90** | 166 | 181 | 165 | 173 | 160 | 166 | 162 | 155 | 168 | 168 |
| **Nb93** | 25 | 26 | 24 | 26 | 25 | 24 | 25 | 24 | 26 | 24 |
| **Ba138** | 1273 | 1143 | 1231 | 1298 | 1255 | 1263 | 1259 | 1254 | 1259 | 1270 |
| **La139** | 65 | 64 | 63 | 69 | 66 | 66 | 65 | 66 | 66 | 65 |
| **Ce140** | 120.7 | 118.9 | 113.2 | 123.7 | 117.6 | 119.6 | 116.6 | 120.6 | 119.3 | 120.9 |
| **Pr141** | 11.7 | 12.3 | 11.4 | 12.0 | 11.7 | 12.3 | 12.3 | 12.0 | 11.9 | 11.8 |
| **Nd146** | 45 | 44 | 43 | 47 | 41 | 43 | 42 | 41 | 44 | 42 |
| **Sm147** | 7.5 | 8.2 | 7.5 | 9.7 | 8.8 | 9.0 | 7.5 | 9.7 | 7.1 | 8.2 |
| **Sm149** | 7.9 | 7.5 | 9.4 | 8.4 | 8.9 | 9.1 | 7.5 | 9.5 | 8.0 | 8.1 |
| **Eu153** | 1.8 | 1.6 | 1.5 | 1.9 | 1.7 | 1.7 | 1.6 | 1.9 | 1.7 | 1.8 |
| **Gd157** | 6.2 | 5.6 | 6.9 | 6.8 | 6.3 | 6.2 | 5.5 | 8.2 | 5.1 | 6.6 |
| **Dy163** | 3.8 | 3.9 | 3.7 | 4.3 | 3.5 | 3.8 | 3.8 | 3.3 | 3.7 | 3.8 |
| **Er166** | 2.2 | 2.1 | 1.9 | 2.1 | 1.8 | 2.1 | 1.9 | 1.9 | 1.9 | 1.9 |
| **Yb172** | 2.0 | 1.8 | 1.9 | 2.4 | 2.0 | 2.5 | 2.1 | 2.4 | 1.9 | 2.2 |
| **Lu175** | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.5 | 0.3 | 0.4 |
| **Ta181** | 1.3 | 1.4 | 1.3 | 1.4 | 1.4 | 1.3 | 1.4 | 1.4 | 1.4 | 1.5 |
| **Pb208** | 30 | 28 | 27 | 29 | 29 | 28 | 29 | 34 | 30 | 30 |
| **Th232** | 28 | 31 | 25 | 29 | 27 | 28 | 27 | 27 | 28 | 28 |
| **U238** | 8.6 | 9.2 | 8.2 | 8.6 | 8.2 | 8.5 | 8.4 | 8.5 | 8.9 | 8.6 |

Table E2: List of data produced through LA-ICP-MS for Vulcanello glass samples.

LA-ICP-MS Secondary Standard Data

A selection of secondary standards (atho, StHs6/80 and gor 128) were analysed during each run in order to help identify any systematic errors which may occur during the run, such as instrumental instability due to the atmospheric pressure or any background interference on the peaks. By comparing the secondary standards to their GeoRem value, it is possible to get a good indicator of the error. Table E3 contains a list of the secondary standards analysed during the LA-ICP-MS work.

| | AT2 | AT8 | R46 | AT13&S77 | AT4&S33 | 14PLB | AT1CA5 | GR46GAT2 | **GeoRem Value** | |
|---|---|---|---|---|---|---|---|---|---|---|
| **(in ppm)** | atho | atho | atho | atho | atho | atho | atho | atho | atho | +/- |
| **Ca43** | 12786 | 14639 | 13803 | 12918 | 11722 | 12185 | 12378 | 12417 | | |
| **CaO (wt%)** | 1.3 | 1.5 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.7 | 0.03 |
| **Sc45** | 14 | 15 | 18 | 15 | 17 | 9 | 8 | 8 | 5 | 0.8 |
| **Ni60** | <LOD | 32 | 27 | <LOD | <LOD | 20 | 20 | 15 | 13 | 5 |
| **Rb85** | 68.9 | 68.2 | 67.7 | 65.7 | 65.9 | 65.5 | 67.9 | 63.8 | 65.3 | 3 |
| **Sr88** | 96.4 | 97.2 | 98.0 | 92.1 | 90.1 | 92.6 | 93.3 | 92.4 | 94.1 | 2.7 |
| **Y89** | 89.8 | 93.6 | 91.9 | 87.6 | 87.2 | 88.9 | 90.8 | 89.1 | 94.5 | 3.5 |
| **Zr90** | 523 | 504 | 505 | 492 | 455 | 481 | 490 | 481 | 512 | 20 |
| **Nb93** | 62.0 | 60.3 | 62.0 | 59.1 | 58.4 | 58.4 | 59.3 | 57.6 | 62.4 | 2.6 |
| **Ba138** | 574 | 572 | 546 | 554 | 533 | 549 | 547 | 547 | 547 | 16 |
| **La139** | 56.0 | 53.5 | 56.6 | 53.6 | 52.4 | 54.4 | 54.7 | 54.8 | 55.6 | 1.5 |
| **Ce140** | 127 | 125 | 117 | 123 | 114 | 120 | 121 | 119 | 121 | 4 |
| **Pr141** | 14.1 | 15.8 | 14.7 | 14.2 | 13.5 | 14.1 | 14.3 | 13.9 | 14.6 | 0.4 |
| **Nd146** | 60.5 | 61.7 | 62.5 | 58.1 | 56.4 | 60.6 | 62.7 | 58.5 | 60.9 | 2 |
| **Sm147** | 15.1 | 15.5 | 15.4 | 15.5 | 13.4 | 14.0 | 14.3 | 14.4 | 14.2 | 0.4 |
| **Sm149** | 13.4 | 15.9 | 13.8 | 12.9 | 13.4 | 14.2 | 14.6 | 14.4 | 14.2 | 0.4 |
| **Eu153** | 2.74 | 2.79 | 2.58 | 2.64 | 2.42 | 2.42 | 2.82 | 2.33 | 2.76 | 0.1 |
| **Gd157** | 15.9 | 15.2 | 15.7 | 13.5 | 15.0 | 14.2 | 14.8 | 13.9 | 15.3 | 0.7 |
| **Dy163** | 16.9 | 17.2 | 17.7 | 16.0 | 15.4 | 16.1 | 16.0 | 16.1 | 16.2 | 0.7 |
| **Er166** | 11.0 | 10.2 | 10.8 | 9.9 | 9.5 | 9.8 | 10.2 | 9.9 | 10.3 | 0.5 |
| **Yb172** | 10.3 | 10.1 | 10.1 | 9.9 | 9.3 | 9.5 | 10.2 | 10.1 | 10.5 | 0.4 |
| **Lu175** | 1.53 | 1.52 | 1.40 | 1.52 | 1.39 | 1.46 | 1.47 | 1.41 | 1.54 | 0.05 |
| **Ta181** | 4.0 | 4.1 | 3.8 | 3.9 | 3.6 | 3.6 | 3.6 | 3.6 | 3.9 | 0.2 |
| **Pb208** | 6.29 | 6.23 | 6.33 | 5.49 | 4.02 | 5.18 | 3.24 | 5.10 | 5.67 | 0.62 |
| **Th232** | 7.5 | 7.3 | 7.1 | 7.6 | 6.7 | 7.2 | 7.2 | 6.9 | 7.4 | 0.27 |
| **U238** | 2.40 | 2.32 | 2.15 | 2.34 | 2.18 | 2.29 | 2.26 | 2.26 | 2.37 | 0.12 |
| | AT2 | AT8 | R46 | AT13&AT77 | AT4&S33 | 14PLB | AT1CA5 | GR46GAT2 | **GeoRem Value** | |
| **(in ppm)** | sths6/80 | sths6/80 | sths6/80 | sths6/80 | sths6/80 | sths6/80 | sths6/80 | sths6/80 | sths6/80 | +/- |
| **Ca43** | 37736 | 37217 | 36875 | 35151 | 37736 | 37736 | 37736 | 37736 | | |
| **CaO (wt%)** | 5.28 | 5.21 | 5.16 | 4.92 | 5.28 | 5.28 | 5.28 | 5.28 | 5.28 | 0.09 |
| **Sc45** | 15.9 | 18.6 | 20.1 | 16.6 | 18.9 | 12.4 | 12.1 | 11.7 | 11.5 | 0.8 |
| **Ni60** | 40.2 | 33.5 | 34.1 | 34.1 | 42.9 | 24.0 | 20.1 | 20.5 | 23.7 | 3.8 |
| **Rb85** | 31.5 | 33.9 | 32.1 | 31.4 | 31.9 | 30.1 | 30.1 | 30.2 | 30.7 | 1.7 |
| **Sr88** | 470 | 474 | 483 | 453 | 469 | 465 | 482 | 459 | 482 | 8 |
| **Y89** | 11.1 | 10.9 | 11.8 | 10.3 | 10.7 | 10.5 | 10.8 | 10.4 | 11.4 | 0.4 |
| **Zr90** | 121 | 114 | 113 | 111 | 108 | 111 | 114 | 111 | 118 | 3 |
| **Nb93** | 6.76 | 6.95 | 6.94 | 5.73 | 6.41 | 6.35 | 6.13 | 5.98 | 6.94 | 0.25 |
| **Ba138** | 305 | 295 | 297 | 284 | 301 | 297 | 294 | 287 | 298 | 9 |
| **La139** | 12 | 12 | 12 | 11 | 11 | 12 | 12 | 11 | 12 | 0.3 |
| **Ce140** | 25.6 | 25.2 | 25.3 | 23.6 | 25.2 | 23.9 | 25.4 | 24.2 | 26.1 | 0.7 |
| **Pr141** | 2.7 | 3.1 | 3.2 | 2.5 | 2.8 | 2.5 | 2.9 | 2.8 | 3.2 | 0.06 |
| **Nd146** | 13 | 13 | 14 | 12 | 12 | 11 | 13 | 12 | 13 | 0.3 |
| **Sm147** | 6.08 | 5.78 | 6.18 | 4.23 | 4.32 | 3.39 | 3.01 | 2.55 | 2.78 | 0.05 |
| **Sm149** | 5.56 | 6.27 | 5.79 | 4.51 | 4.75 | 3.23 | 2.90 | 2.65 | 2.78 | 0.05 |
| **Eu153** | 1.10 | 1.18 | 1.30 | 0.92 | 1.04 | 0.88 | 0.94 | 0.86 | 0.953 | 0.022 |
| **Gd157** | 3.94 | 3.78 | 4.46 | 4.01 | 3.84 | 3.00 | 2.32 | 2.13 | 2.59 | 0.09 |
| **Dy163** | 2.41 | 2.56 | 2.47 | 2.17 | 2.19 | 1.80 | 2.11 | 2.09 | 2.22 | 0.06 |
| **Er166** | 1.51 | 2.11 | 1.66 | 1.23 | 1.27 | 1.21 | 1.18 | 1.13 | 1.18 | 0.04 |
| **Yb172** | 2.01 | 2.25 | 1.71 | 1.56 | 1.60 | 1.11 | 1.19 | 1.09 | 1.13 | 0.03 |
| **Lu175** | 0.59 | 0.41 | 0.42 | 0.22 | 0.26 | 0.23 | 0.17 | 0.14 | 0.168 | 0.006 |
| **Ta181** | 0.77 | 0.77 | 0.71 | 0.49 | 0.55 | 0.38 | 0.37 | 0.40 | 0.42 | 0.015 |
| **Pb208** | 11 | 10 | 11 | 10 | 11 | 11 | 10 | 10 | 10.3 | 0.9 |
| **Th232** | 2.14 | 2.35 | 2.24 | 2.33 | 2.24 | 1.99 | 2.24 | 2.1 | 2.28 | 0.07 |
| **U238** | 1.08 | 1.24 | 1.13 | 1.10 | 1.09 | 0.93 | 0.96 | 0.92 | 1.01 | 0.04 |
| | S38eS32b | AT6 | AT8 | AT13&S77 | S90&86 | AT1CA5 | GR46GAT2 | S38eS32b | **GeoRem Value** | |
| **(in ppm)** | sths6/80 | gor128 | gor128 | gor128 | gor128 | gor128 | gor128 | gor128 | gor128 | +/- |
| **Ca43** | 37736 | 42253 | 39768.857 | 38121.9 | 40408.0 | 40870 | 39314 | 40994 | | |
| **CaO (wt%)** | 5.28 | 5.91 | 5.56 | 5.33 | 5.65 | 5.72 | 5.50 | 5.74 | 6.24 | 0.12 |
| **Sc45** | 12.0 | 31.9 | 30.9 | 27.3 | 28.6 | 30.3 | 29.5 | 30.3 | 32.1 | 1.4 |
| **Ni60** | 3926.4 | 1451 | 1334 | 1142 | 1339 | 1174 | 1154 | 1163 | 1074 | 61 |
| **Rb85** | 30.5 | <LOD | <LOD | <LOD | <LOD | 0.54 | 0.56 | 0.57 | 0.406 | 0.025 |
| **Sr88** | 470 | 30 | 29 | 25 | 28 | 28 | 28 | 28 | 30 | 1 |
| **Y89** | 11.1 | 10.6 | 10.8 | 10.0 | 10.9 | 10.5 | 10.3 | 10.6 | 11.8 | 0.5 |
| **Zr90** | 112 | 9 | 9 | 8 | 9 | 9 | 9 | 9 | 10 | 0.5 |
| **Nb93** | 6.30 | 1.01 | 1.22 | <LOD | 0.59 | 0.17 | 0.20 | 0.21 | 0.099 | 0.007 |
| **Ba138** | 290 | 1.93 | 1.70 | 1.50 | 1.47 | 0.94 | 0.85 | 0.84 | 1.06 | 0.03 |
| **La139** | 11 | <LOD | 0.58 | 0.57 | 0.54 | 0.17 | 0.17 | 0.19 | 0.121 | 0.004 |
| **Ce140** | 24.9 | 0.93 | 0.63 | 0.65 | 0.67 | 0.36 | 0.37 | 0.38 | 0.45 | 0.016 |
| **Pr141** | 2.9 | <LOD | 0.7 | <LOD | 0.4 | 0.1 | 0.1 | 0.1 | 0.1 | 0.004 |
| **Nd146** | 12 | 3.36 | 3.37 | 4.16 | 2.56 | 0.97 | 0.82 | 0.75 | 0.784 | 0.047 |
| **Sm147** | 2.41 | 2.25 | 4.09 | 3.11 | 4.55 | 0.80 | 0.82 | 0.81 | 0.525 | 0.02 |
| **Sm149** | 2.63 | <LOD | 2.97 | <LOD | 4.09 | 0.93 | 0.92 | 0.86 | 0.525 | 0.02 |
| **Eu153** | 0.91 | 0.45 | 0.62 | 0.47 | 0.42 | 0.24 | 0.24 | 0.24 | 0.264 | 0.008 |
| **Gd157** | 2.53 | 3.18 | 2.43 | 2.97 | 4.43 | 1.30 | 1.00 | 1.19 | 1.17 | 0.04 |
| **Dy163** | 2.24 | 2.05 | 2.33 | 1.92 | 1.60 | 1.70 | 1.62 | 1.82 | 1.98 | 0.07 |
| **Er166** | 1.12 | 1.6 | 1.5 | 1.2 | 1.2 | 1.3 | 1.3 | 1.2 | 1.4 | 0.06 |
| **Yb172** | 0.93 | 1.89 | 1.80 | 1.41 | 1.42 | 1.26 | 1.25 | 1.20 | 1.14 | 0.06 |
| **Lu175** | 0.15 | 0.38 | 0.28 | 0.22 | 0.27 | 0.19 | 0.19 | 0.18 | 0.206 | 0.009 |
| **Ta181** | 0.41 | <LOD | 0.30 | <LOD | 0.39 | 0.09 | 0.08 | 0.08 | 0.019 | 0.001 |
| **Pb208** | 10 | <LOD | <LOD | <LOD | <LOD | 0.47 | 0.46 | 0.66 | 0.345 | 0.043 |
| **Th232** | 2.16 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.01 | 0.001 |
| **U238** | 0.91 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.10 | 0.01 | 0.0012 |

Table E3: Table of the Secondary Standard values run during the glass analysis along with the accepted GeoRem values for the standards.

## APPENDIX F – Principal Component Analysis Results

Principal Component Analysis (PCA) was undertaken to further investigate the relationship between the suspected Palizzi deposit found on Vulcanello and the proximal Palizzi Rhyolite from La Fossa. The PCA was carried out on the deposits from the Palizzi Cycle using the RESET Database Plotter (www.c14.arch.ox.ac.uk/db). The results of this analysis are shown in Table F1.

| | $SiO_2$ | $TiO_2$ | $Al_2O_3$ | FeOt | MnO | MgO | CaO | $Na_2O$ | $K_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| **$SiO_2$** | 1.00 | -0.97 | -0.94 | -0.92 | -0.48 | -0.93 | -0.90 | -0.66 | -0.60 |
| **$TiO_2$** | -0.97 | 1.00 | 0.95 | 0.87 | 0.44 | 0.87 | 0.83 | 0.69 | 0.59 |
| **$Al_2O_3$** | -0.94 | 0.95 | 1.00 | 0.76 | 0.41 | 0.78 | 0.74 | 0.68 | 0.69 |
| **FeOt** | -0.92 | 0.87 | 0.76 | 1.00 | 0.52 | 0.97 | 0.95 | 0.56 | 0.34 |
| **MnO** | -0.48 | 0.44 | 0.41 | 0.52 | 1.00 | 0.49 | 0.50 | 0.28 | 0.15 |
| **MgO** | -0.93 | 0.87 | 0.78 | 0.97 | 0.49 | 1.00 | 0.97 | 0.53 | 0.38 |
| **CaO** | -0.90 | 0.83 | 0.74 | 0.95 | 0.50 | 0.97 | 1.00 | 0.50 | 0.31 |
| **$Na_2O$** | -0.66 | 0.69 | 0.68 | 0.56 | 0.28 | 0.53 | 0.50 | 1.00 | 0.21 |
| **$K_2O$** | -0.60 | 0.59 | 0.69 | 0.34 | 0.15 | 0.38 | 0.31 | 0.21 | 1.00 |
| | **PC1** | **PC2** | **PC3** | **PC4** | **PC5** | **PC6** | **PC7** | **PC8** | **PC9** |
| **$SiO_2$** | -0.39 | -0.08 | 0.00 | 0.06 | 0.01 | -0.03 | 0.18 | 0.12 | 0.89 |
| **$TiO_2$** | 0.38 | 0.13 | -0.07 | 0.01 | -0.40 | -0.51 | 0.64 | 0.00 | 0.04 |
| **$Al_2O_3$** | 0.36 | 0.29 | -0.04 | 0.15 | -0.61 | 0.21 | -0.51 | 0.12 | 0.27 |
| **FeOt** | 0.37 | -0.23 | 0.00 | -0.25 | 0.29 | -0.55 | -0.43 | -0.32 | 0.27 |
| **MnO** | 0.21 | -0.46 | 0.56 | 0.65 | 0.02 | 0.01 | 0.03 | 0.02 | 0.00 |
| **MgO** | 0.37 | -0.19 | 0.04 | -0.31 | 0.23 | 0.10 | 0.05 | 0.81 | 0.05 |
| **CaO** | 0.36 | -0.25 | 0.03 | -0.34 | -0.04 | 0.60 | 0.29 | -0.45 | 0.18 |
| **$Na_2O$** | 0.27 | 0.01 | -0.71 | 0.52 | 0.36 | 0.13 | 0.06 | -0.02 | 0.07 |
| **$K_2O$** | 0.22 | 0.73 | 0.41 | 0.07 | 0.45 | 0.08 | 0.10 | -0.08 | 0.14 |
| $\lambda$ | 6.44 | 1.04 | 0.72 | 0.60 | 0.09 | 0.06 | 0.03 | 0.02 | 0.00 |

Table F1: Results for PCA of the Palizzi Deposits (both effusive and explosive)

**APPENDIX G – Phenocryst (including Zoned Phenocryst) Analysis**

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Sample Preparation for the Phenocryst Analysis

- Samples cleaned manually, then in an ultrasonic bath, before being dried over night at 50°C.
- Samples then crushed lightly with a hammer before being split into two.
- 15 – 20 shards were mounted on a glass slide and any larger phenocrysts were handpicked using a microscope.
- The glass slide was mounted in epoxy resin to make a stub, and then polished.
- The stubs were cleaned with ethanol, then carbon coated.
- Carbon coating was done at Department of Archaeology, University of Oxford.
- Stubs were then loaded into the EMPA-WDS (Jeol 8600 equipped with 4 spectrometers and SamX software) in the Department of Archaeology, University of Oxford.
- The EMPA was set up and calibrated by Dr. Victoria Smith with secondary standards used to check the precision and accuracy of the run.
    - Accelerating voltage : 15kV
    - Beam current: 20nA (for mineral analysis)
    - defocused (10μm) beam to minimise Na migration
    - Count times: 30s on each peak, except for Na (10s) and Cl & P (60s)
    - Calibrated for each set of beam conditions using a suite of appropriate mineral standards
    - Secondary Standards used: USNM plagioclase and USNM pyrope
    - Absorption correction method: PAP
- Points for analysis were programmed into the microprobe, using the attached SEM to help with choosing optimal locations.
- Once all points were programmed, the microprobe was set running over night.

EMPA Data

The EMPA mineral data produced during this research is shown in the tables on the next 29 pages. The tables are divided by the location of where the samples were collected: on La Fossa, Vulcanello. The tables also include the date the analysis was run (which means that they can be linked to the exact secondary standards for each run) and the name of the eruptive unit the sample came from. The start of the sample label is the sample name (and this will match up with the name given in table B1-B4). The second part of the sample label is the clast or phenocryst number within the analytical stub and the final part is the analysis number for that individual clast.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 |
| **Label** | AT13.1.1 | AT13.1.2 | AT13.1.3 | AT13.1.4 | AT13.1.5 | AT13.10.1 | AT13.10.2 | AT13.11.1 | AT13.11.2 | AT13.11.4 |
| | ol | cpx | cpx | ol | ol | cpx | cpx | cpx | ol | cpx |
| **Na2O** | 0.00 | 0.28 | 0.31 | 0.02 | 0.02 | 0.27 | 0.25 | 0.46 | 0.00 | 0.43 |
| **MgO** | 32.75 | 15.59 | 16.08 | 32.54 | 32.46 | 15.89 | 16.49 | 13.82 | 32.30 | 14.37 |
| **Al2O3** | 0.00 | 2.96 | 2.83 | 0.00 | 0.01 | 2.68 | 1.35 | 2.52 | 0.02 | 1.87 |
| **SiO2** | 37.03 | 52.48 | 52.24 | 36.75 | 37.20 | 52.71 | 52.36 | 51.64 | 37.36 | 52.02 |
| **K2O** | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **CaO** | 0.28 | 23.15 | 23.16 | 0.29 | 0.28 | 23.37 | 22.57 | 21.17 | 0.30 | 20.79 |
| **TiO2** | 0.01 | 0.52 | 0.49 | 0.03 | 0.00 | 0.48 | 0.26 | 0.44 | 0.00 | 0.34 |
| **MnO** | 0.74 | 0.16 | 0.12 | 0.78 | 0.68 | 0.12 | 0.14 | 0.41 | 0.71 | 0.35 |
| **FeOt** | 29.65 | 5.27 | 5.10 | 29.41 | 29.44 | 4.17 | 4.70 | 9.31 | 29.31 | 9.20 |
| **Total** | 100.46 | 100.42 | 100.32 | 99.83 | 100.08 | 99.70 | 98.13 | 99.78 | 99.99 | 99.36 |
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 |
| **Label** | AT13.11.5 | AT13.11.6 | AT13.11.7a1 | AT13.11.7b1 | AT13.11.7c1 | AT13.11.7d1 | T13.13.1cor | T13.13.1cor | T13.13.1rim | T13.13.1rim |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.33 | 0.44 | 0.23 | 0.44 | 0.47 | 0.25 | 0.43 | 0.41 | 0.31 | 0.26 |
| **MgO** | 12.26 | 14.31 | 16.22 | 13.98 | 13.80 | 16.46 | 14.31 | 13.90 | 14.93 | 15.22 |
| **Al2O3** | 0.84 | 3.12 | 2.43 | 2.39 | 2.74 | 1.97 | 2.79 | 3.30 | 2.76 | 2.24 |
| **SiO2** | 52.21 | 51.54 | 53.01 | 51.82 | 51.83 | 53.50 | 51.72 | 51.25 | 52.66 | 52.24 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.05 |
| **CaO** | 18.64 | 22.03 | 23.08 | 21.53 | 21.43 | 23.03 | 21.80 | 21.87 | 23.03 | 21.30 |
| **TiO2** | 0.18 | 0.52 | 0.37 | 0.42 | 0.49 | 0.32 | 0.55 | 0.50 | 0.48 | 0.44 |
| **MnO** | 0.82 | 0.17 | 0.16 | 0.33 | 0.25 | 0.15 | 0.25 | 0.31 | 0.15 | 0.23 |
| **FeOt** | 14.08 | 8.08 | 4.56 | 8.90 | 9.17 | 4.54 | 8.29 | 8.58 | 5.60 | 7.70 |
| **Total** | 99.35 | 100.21 | 100.07 | 99.82 | 100.16 | 100.22 | 100.14 | 100.12 | 99.95 | 99.66 |
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 |
| **Label** | AT13.13.2 | AT13.13.3 | AT13.13.4 | AT13.14.1 | AT13.14.2 | AT13.14.4 | AT13.14.5 | AT13.14.6 | AT13.14.7 | AT13.15.1 |
| | cpx | cpx | cpx | feld | feld | cpx | cpx | cpx | cpx | feld |
| **Na2O** | 0.53 | 0.23 | 0.27 | 5.46 | 5.31 | 0.38 | 0.36 | 0.42 | 0.36 | 5.26 |
| **MgO** | 13.69 | 16.36 | 15.21 | 0.02 | 0.00 | 12.21 | 12.71 | 12.52 | 12.43 | 0.05 |
| **Al2O3** | 2.88 | 2.24 | 2.37 | 22.23 | 20.06 | 0.80 | 0.96 | 2.70 | 0.77 | 27.35 |
| **SiO2** | 51.35 | 52.75 | 52.65 | 65.29 | 66.32 | 51.82 | 52.43 | 51.04 | 52.13 | 56.26 |
| **K2O** | 0.02 | 0.01 | 0.00 | 5.11 | 8.12 | 0.01 | 0.00 | 0.01 | 0.02 | 1.55 |
| **CaO** | 21.33 | 22.74 | 22.96 | 2.86 | 0.97 | 18.71 | 18.83 | 21.04 | 18.72 | 9.30 |
| **TiO2** | 0.55 | 0.30 | 0.36 | 0.03 | 0.03 | 0.18 | 0.19 | 0.52 | 0.18 | 0.05 |
| **MnO** | 0.27 | 0.13 | 0.10 | 0.00 | 0.00 | 0.82 | 0.86 | 0.51 | 0.83 | 0.00 |
| **FeOt** | 9.15 | 4.84 | 6.01 | 0.34 | 0.30 | 14.30 | 13.58 | 11.31 | 14.07 | 0.60 |
| **Total** | 99.77 | 99.60 | 99.93 | 101.34 | 101.11 | 99.23 | 99.93 | 100.06 | 99.50 | 100.41 |
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 |
| **Label** | AT13.15.2 | AT13.15.3 | AT13.2.1 | AT13.2.10 | AT13.2.3 | AT13.2.4 | AT13.2.5 | AT13.2.6 | AT13.2.7 | AT13.2.8 |
| | feld | feld | cpx | cpx | feld | cpx | cpx | feld | feld | feld |
| **Na2O** | 5.06 | 4.99 | 0.28 | 0.36 | 2.85 | 0.22 | 0.30 | 2.05 | 4.16 | 1.96 |
| **MgO** | 0.05 | 0.05 | 15.99 | 15.26 | 0.85 | 16.74 | 16.41 | 0.94 | 0.01 | 0.91 |
| **Al2O3** | 28.00 | 27.54 | 1.63 | 3.43 | 17.45 | 1.60 | 2.83 | 18.63 | 20.71 | 18.66 |
| **SiO2** | 54.88 | 56.17 | 53.46 | 51.19 | 62.68 | 49.74 | 51.76 | 64.54 | 63.83 | 65.63 |
| **K2O** | 1.56 | 1.60 | 0.03 | 0.00 | 5.78 | 0.01 | 0.03 | 5.03 | 9.56 | 4.97 |
| **CaO** | 9.68 | 9.68 | 21.59 | 22.32 | 2.03 | 20.69 | 22.62 | 1.80 | 1.32 | 1.76 |
| **TiO2** | 0.03 | 0.05 | 0.33 | 0.63 | 0.44 | 0.31 | 0.46 | 0.37 | 0.15 | 0.40 |
| **MnO** | 0.00 | 0.00 | 0.29 | 0.17 | 0.18 | 0.23 | 0.16 | 0.17 | 0.01 | 0.16 |
| **FeOt** | 0.68 | 0.58 | 6.90 | 6.54 | 5.40 | 5.58 | 5.17 | 5.38 | 0.36 | 5.06 |
| **Total** | 99.94 | 100.66 | 100.51 | 99.92 | 97.66 | 95.11 | 99.75 | 98.89 | 100.11 | 99.52 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 |
| **Label** | AT13.2.9 | AT13.3.10 | AT13.3.2 | AT13.3.3 | AT13.3.4 | AT13.3.5 | AT13.3.6 | AT13.3.7 | AT13.3.8 | AT13.3.9 |
| | cpx | cpx | ol | cpx | feld | cpx | cpx | feld | cpx | cpx |
| **Na2O** | 0.54 | 0.27 | 0.03 | 0.30 | 2.07 | 0.27 | 0.33 | 5.49 | 0.47 | 0.36 |
| **MgO** | 11.37 | 16.03 | 34.13 | 13.86 | 0.21 | 16.44 | 15.32 | 0.00 | 13.93 | 14.27 |
| **Al2O3** | 5.82 | 2.42 | 0.00 | 1.17 | 13.74 | 2.67 | 3.18 | 21.10 | 3.04 | 3.36 |
| **SiO2** | 47.50 | 52.76 | 38.12 | 52.72 | 69.97 | 52.19 | 51.98 | 64.52 | 50.99 | 50.94 |
| **K2O** | 0.04 | 0.01 | 0.03 | 0.01 | 4.89 | 0.02 | 0.03 | 7.79 | 0.02 | 0.00 |
| **CaO** | 20.78 | 23.23 | 0.18 | 20.24 | 1.11 | 22.97 | 22.70 | 1.69 | 21.45 | 22.06 |
| **TiO2** | 1.13 | 0.39 | 0.02 | 0.26 | 0.94 | 0.44 | 0.58 | 0.03 | 0.54 | 0.53 |
| **MnO** | 0.33 | 0.09 | 0.82 | 0.56 | 0.10 | 0.08 | 0.13 | 0.01 | 0.32 | 0.20 |
| **FeOt** | 11.55 | 4.30 | 26.34 | 10.93 | 4.04 | 4.66 | 5.62 | 0.46 | 9.08 | 7.96 |
| **Total** | 99.05 | 99.50 | 99.66 | 100.06 | 97.07 | 99.75 | 99.86 | 101.09 | 99.83 | 99.69 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 |
| **Label** | AT13.4.1 | AT13.4.2 | AT13.4.3 | AT13.4.4 | AT13.4.5 | AT13.4.6 | AT13.4.7 | AT13.4.8 | AT13.5.1 | AT13.5.2 |
| | feld | feld | ol | ol | ol | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 5.37 | 5.31 | 0.00 | 0.00 | 0.00 | 0.43 | 0.45 | 0.38 | 0.26 | 0.33 |
| **MgO** | 0.05 | 0.05 | 32.23 | 32.28 | 32.35 | 14.37 | 13.65 | 14.38 | 16.09 | 14.63 |
| **Al2O3** | 26.03 | 26.29 | 0.01 | 0.03 | 0.01 | 2.24 | 3.42 | 2.46 | 2.30 | 3.55 |
| **SiO2** | 57.97 | 58.18 | 37.40 | 37.42 | 37.54 | 52.24 | 51.06 | 52.14 | 52.85 | 51.44 |
| **K2O** | 2.24 | 2.39 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 |
| **CaO** | 8.09 | 7.80 | 0.28 | 0.28 | 0.27 | 21.64 | 21.61 | 21.67 | 23.42 | 22.57 |
| **TiO2** | 0.06 | 0.05 | 0.00 | 0.01 | 0.00 | 0.40 | 0.56 | 0.40 | 0.31 | 0.60 |
| **MnO** | 0.00 | 0.00 | 0.74 | 0.75 | 0.82 | 0.32 | 0.32 | 0.35 | 0.15 | 0.16 |
| **FeOt** | 0.63 | 0.55 | 29.12 | 28.98 | 29.07 | 8.57 | 9.04 | 8.55 | 4.86 | 7.34 |
| **Total** | 100.43 | 100.62 | 99.77 | 99.75 | 100.05 | 100.20 | 100.12 | 100.33 | 100.24 | 100.63 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 | 1888-90 |
| **Label** | AT13.5.3 | AT13.6.1 | AT13.6.2 | AT13.7.1 | AT13.7.2 | AT13.7.3 | AT13.8.1 | AT13.8.3 | AT13.8.4 | AT13.8.5 |
| | cpx | cpx | cpx | feld | feld | feld | cpx | cpx | cpx | cpx |
| **Na2O** | 0.30 | 0.45 | 0.42 | 4.73 | 4.90 | 5.75 | 0.46 | 0.40 | 0.40 | 0.33 |
| **MgO** | 15.96 | 13.51 | 14.31 | 0.01 | 0.00 | 0.00 | 13.59 | 14.07 | 14.58 | 14.71 |
| **Al2O3** | 2.86 | 3.30 | 1.96 | 19.73 | 20.48 | 20.99 | 3.18 | 2.99 | 2.20 | 2.38 |
| **SiO2** | 52.66 | 50.74 | 51.73 | 65.81 | 66.63 | 65.97 | 51.07 | 51.58 | 52.31 | 52.22 |
| **K2O** | 0.00 | 0.00 | 0.01 | 9.03 | 7.66 | 7.14 | 0.00 | 0.00 | 0.00 | 0.01 |
| **CaO** | 23.49 | 21.72 | 21.17 | 1.04 | 1.20 | 1.58 | 21.49 | 21.74 | 21.52 | 22.24 |
| **TiO2** | 0.47 | 0.52 | 0.35 | 0.03 | 0.03 | 0.05 | 0.58 | 0.49 | 0.48 | 0.38 |
| **MnO** | 0.10 | 0.28 | 0.36 | 0.00 | 0.00 | 0.00 | 0.33 | 0.31 | 0.30 | 0.21 |
| **FeOt** | 4.26 | 8.70 | 8.73 | 0.32 | 0.26 | 0.30 | 9.17 | 8.64 | 8.09 | 7.41 |
| **Total** | 100.10 | 99.24 | 99.05 | 100.70 | 101.16 | 101.78 | 99.86 | 100.22 | 99.87 | 99.88 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | 1888-90 | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | AT13.8.6 | S90ca.4.1 | S90ca.4.2 | S90ca.4.3 | S90ca.4.4 | S90ca.5.1 | S90ca.5.6 | S90ca.7.1 | S90ca.7.2 | S90ca.7.3 |
| | cpx | feld | feld | feld | feld | feld | cpx | feld | cpx | cpx |
| **Na2O** | 0.42 | 4.77 | 4.80 | 4.70 | 4.62 | 5.12 | 0.23 | 2.14 | 0.33 | 0.28 |
| **MgO** | 13.47 | 0.04 | 0.06 | 0.07 | 0.06 | 0.06 | 17.02 | 1.48 | 14.82 | 15.81 |
| **Al2O3** | 4.47 | 27.10 | 27.10 | 27.65 | 27.13 | 26.49 | 1.24 | 18.63 | 3.62 | 2.25 |
| **SiO2** | 49.82 | 56.24 | 56.69 | 56.07 | 55.75 | 57.47 | 53.87 | 59.33 | 50.10 | 52.72 |
| **K2O** | 0.05 | 1.60 | 1.65 | 1.44 | 1.53 | 2.09 | 0.01 | 6.00 | 0.01 | 0.00 |
| **CaO** | 21.58 | 9.46 | 9.28 | 9.83 | 9.77 | 8.50 | 22.82 | 3.61 | 22.55 | 22.56 |
| **TiO2** | 0.90 | 0.03 | 0.04 | 0.02 | 0.05 | 0.05 | 0.17 | 0.64 | 0.73 | 0.33 |
| **MnO** | 0.22 | 0.02 | 0.00 | 0.02 | 0.00 | 0.02 | 0.18 | 0.17 | 0.16 | 0.19 |
| **FeOt** | 8.48 | 0.68 | 0.64 | 0.62 | 0.66 | 0.55 | 4.76 | 5.94 | 6.37 | 5.82 |
| **Total** | 99.41 | 99.95 | 100.24 | 100.42 | 99.57 | 100.34 | 100.30 | 97.96 | 98.70 | 99.97 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | S90ca.7.4 | S90ca.7.5 | S90ca.7.6 | S90ca.7.7 | S90ca.7.8 | S90ca.8.1 | S90ca.8.2 | S90ca.8.3 | S90ca.8.4 | S90cb.5.1 |
| | cpx | cpx | cpx | cpx | feld | feld | feld | feld | feld | feld |
| **Na2O** | 0.42 | 0.24 | 0.25 | 0.45 | 5.34 | 5.30 | 5.06 | 5.13 | 4.96 | 5.29 |
| **MgO** | 14.13 | 16.59 | 16.34 | 13.74 | 0.06 | 0.04 | 0.06 | 0.05 | 0.04 | 0.07 |
| **Al2O3** | 2.65 | 2.29 | 2.19 | 3.49 | 27.06 | 26.24 | 25.76 | 25.67 | 27.33 | 26.01 |
| **SiO2** | 51.75 | 52.89 | 52.56 | 50.95 | 56.99 | 57.56 | 56.20 | 55.99 | 56.00 | 57.45 |
| **K2O** | 0.00 | 0.01 | 0.01 | 0.01 | 1.78 | 2.18 | 1.94 | 1.85 | 1.53 | 2.01 |
| **CaO** | 21.56 | 23.15 | 22.91 | 21.63 | 9.01 | 8.45 | 8.42 | 8.98 | 9.89 | 8.64 |
| **TiO2** | 0.48 | 0.32 | 0.33 | 0.66 | 0.04 | 0.04 | 0.05 | 0.04 | 0.04 | 0.05 |
| **MnO** | 0.32 | 0.13 | 0.12 | 0.28 | 0.03 | 0.04 | 0.00 | 0.00 | 0.03 | 0.00 |
| **FeOt** | 8.49 | 4.27 | 5.16 | 8.85 | 0.63 | 0.59 | 0.60 | 0.60 | 0.63 | 0.60 |
| **Total** | 99.82 | 99.89 | 99.86 | 100.06 | 100.93 | 100.44 | 98.09 | 98.33 | 100.45 | 100.12 |
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | S90cb.5.2 | S90cb.5.3 | S90cb.5.4 | S90cb.5.5 | S90cb.7.1 | S90cb.7.2 | S90cb.7.3 | S90cb.7.4 | S90cb.7.5 | S90cb.7.6 |
| | feld | feld | feld | feld | feld | feld | feld | cpx | cpx | cpx |
| **Na2O** | 5.11 | 4.73 | 5.03 | 4.51 | 4.87 | 5.18 | 4.97 | 0.40 | 0.44 | 0.37 |
| **MgO** | 0.05 | 0.06 | 0.21 | 0.07 | 0.06 | 0.04 | 0.05 | 14.59 | 14.11 | 14.44 |
| **Al2O3** | 27.03 | 27.86 | 25.97 | 25.36 | 26.98 | 26.06 | 27.12 | 2.19 | 2.65 | 2.50 |
| **SiO2** | 56.40 | 56.06 | 57.51 | 57.72 | 55.48 | 56.87 | 56.09 | 52.20 | 51.80 | 51.87 |
| **K2O** | 1.62 | 1.45 | 2.57 | 1.57 | 1.42 | 1.94 | 1.53 | 0.01 | 0.00 | 0.00 |
| **CaO** | 9.42 | 10.06 | 8.12 | 8.63 | 9.91 | 8.71 | 9.57 | 21.72 | 21.77 | 21.81 |
| **TiO2** | 0.02 | 0.03 | 0.09 | 0.04 | 0.04 | 0.04 | 0.04 | 0.38 | 0.47 | 0.40 |
| **MnO** | 0.00 | 0.03 | 0.01 | 0.01 | 0.03 | 0.00 | 0.00 | 0.37 | 0.28 | 0.25 |
| **FeOt** | 0.61 | 0.63 | 1.15 | 0.72 | 0.67 | 0.62 | 0.55 | 8.46 | 8.80 | 8.11 |
| **Total** | 100.26 | 100.92 | 100.65 | 98.63 | 99.46 | 99.47 | 99.92 | 100.31 | 100.32 | 99.74 |
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | S90cb.7.7 | S90cb.8.1 | S90cb.8.2 | PCLava.1.1 | PCLava.10.1 | PCLava.10.2 | PCLava.10.3 | PCLava.10.4 | PCLava.13.1 | PCLava.13.2 |
| | cpx | cpx | feld | feld | cpx | cpx | cpx | feld | cpx | ol |
| **Na2O** | 0.42 | 0.30 | 2.11 | 2.26 | 0.22 | 0.41 | 0.25 | 4.99 | 0.44 | 0.00 |
| **MgO** | 14.57 | 15.44 | 1.28 | 0.05 | 17.22 | 13.35 | 16.36 | 0.07 | 13.91 | 31.83 |
| **Al2O3** | 2.36 | 3.08 | 18.60 | 13.77 | 1.27 | 4.80 | 1.55 | 26.71 | 2.87 | 0.00 |
| **SiO2** | 51.75 | 51.93 | 61.59 | 74.30 | 53.97 | 49.23 | 53.47 | 56.08 | 51.06 | 36.75 |
| **K2O** | 0.01 | 0.00 | 6.00 | 4.75 | 0.00 | 0.00 | 0.01 | 1.75 | 0.00 | 0.00 |
| **CaO** | 21.46 | 22.36 | 3.03 | 0.76 | 22.87 | 21.81 | 22.59 | 9.33 | 21.68 | 0.33 |
| **TiO2** | 0.41 | 0.41 | 0.65 | 0.12 | 0.21 | 0.80 | 0.25 | 0.03 | 0.54 | 0.03 |
| **MnO** | 0.36 | 0.16 | 0.14 | 0.08 | 0.18 | 0.26 | 0.19 | 0.00 | 0.27 | 0.74 |
| **FeOt** | 8.55 | 6.17 | 5.92 | 1.82 | 4.65 | 8.86 | 5.40 | 0.69 | 9.01 | 29.70 |
| **Total** | 99.89 | 99.86 | 99.33 | 97.92 | 100.59 | 99.51 | 100.07 | 99.65 | 99.77 | 99.38 |
| **Date Analysed** | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | PCLava.13.4 | PCLava.15.1 | CLava.2.cor | CLava.2.rim | PCLava.3.1 | AT1.b1.c1a1 | AT1.b1.c1b1 | AT1.b1.c1c1 | AT1.b1.c1d1 | AT1.b2.c1 |
| | cpx | feld | cpx | cpx | feld | feld | feld | feld | feld | cpx |
| **Na2O** | 0.49 | 2.17 | 0.39 | 0.29 | 2.24 | 4.42 | 4.02 | 4.11 | 3.88 | 0.22 |
| **MgO** | 13.99 | 0.06 | 14.63 | 15.18 | 0.06 | 0.07 | 0.08 | 0.08 | 0.08 | 16.95 |
| **Al2O3** | 2.59 | 13.43 | 3.59 | 2.73 | 13.75 | 28.16 | 29.49 | 28.89 | 29.20 | 1.36 |
| **SiO2** | 51.39 | 75.11 | 50.20 | 51.04 | 74.56 | 55.03 | 53.48 | 54.02 | 53.27 | 53.75 |
| **K2O** | 0.01 | 4.76 | 0.00 | 0.01 | 4.91 | 1.17 | 0.83 | 0.88 | 0.84 | 0.00 |
| **CaO** | 21.50 | 0.73 | 22.23 | 22.67 | 0.75 | 10.58 | 11.80 | 11.38 | 11.92 | 23.00 |
| **TiO2** | 0.48 | 0.11 | 0.65 | 0.47 | 0.14 | 0.02 | 0.03 | 0.03 | 0.02 | 0.24 |
| **MnO** | 0.34 | 0.06 | 0.23 | 0.10 | 0.04 | 0.01 | 0.00 | 0.00 | 0.01 | 0.15 |
| **FeOt** | 9.10 | 1.80 | 7.10 | 6.34 | 1.89 | 0.72 | 0.64 | 0.69 | 0.65 | 4.22 |
| **Total** | 99.89 | 98.22 | 99.01 | 98.84 | 98.33 | 100.19 | 100.38 | 100.07 | 99.87 | 99.90 |

| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | AT1.b2.c2 | AT1.b2.c3 | AT1.b2.c4 | AT1.b3.c1 | AT1.b3.c1b1 | AT1.b4.c1a1 | AT1.b4.c1a2 | AT1.b4.c1a3 | AT1.b4.c2a1 | AT1.b4.c2b1 |
| | feld | cpx | feld | feld | feld | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 4.58 | 0.36 | 7.14 | 4.07 | 3.71 | 0.46 | 0.43 | 0.42 | 0.39 | 0.41 |
| **MgO** | 0.05 | 12.61 | 0.00 | 0.08 | 0.09 | 13.27 | 13.63 | 14.06 | 14.02 | 13.60 |
| **Al2O3** | 27.71 | 5.39 | 22.99 | 28.90 | 29.14 | 3.01 | 2.89 | 1.99 | 2.75 | 4.45 |
| **SiO2** | 55.69 | 48.54 | 63.36 | 53.70 | 52.53 | 51.16 | 51.36 | 52.16 | 51.49 | 49.76 |
| **K2O** | 1.46 | 0.02 | 2.35 | 0.92 | 0.75 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| **CaO** | 9.95 | 20.93 | 4.55 | 11.37 | 12.25 | 21.49 | 21.46 | 21.38 | 21.93 | 22.23 |
| **TiO2** | 0.05 | 1.05 | 0.04 | 0.04 | 0.04 | 0.55 | 0.53 | 0.37 | 0.52 | 0.59 |
| **MnO** | 0.00 | 0.29 | 0.00 | 0.04 | 0.04 | 0.33 | 0.29 | 0.36 | 0.30 | 0.18 |
| **FeOt** | 0.64 | 10.39 | 0.40 | 0.77 | 0.72 | 9.37 | 9.35 | 9.32 | 8.39 | 8.64 |
| **Total** | 100.14 | 99.58 | 100.84 | 99.90 | 99.27 | 99.65 | 99.94 | 100.06 | 99.79 | 99.87 |

| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | AT1.w1.c1a1 | AT1.w1.c1b1 | AT1.w1.c2a1 | AT1.w1.c2b1 | AT1.w1.c2c1 | AT1.w1.c3a1 | AT1.w1.c3b1 | AT1.w1.c4a1 | AT1.w4.c1 | AT1.w4.c2 |
| | cpx | cpx | cpx | cpx | cpx | ol | ol | feld | feld | feld |
| **Na2O** | 0.47 | 0.38 | 0.43 | 0.38 | 0.39 | 0.01 | 0.00 | 4.20 | 5.65 | 5.40 |
| **MgO** | 13.91 | 14.38 | 13.66 | 13.12 | 14.21 | 31.47 | 31.23 | 0.08 | 0.00 | 0.01 |
| **Al2O3** | 2.78 | 2.85 | 3.03 | 4.71 | 2.75 | 0.00 | 0.00 | 28.66 | 20.76 | 20.54 |
| **SiO2** | 51.58 | 51.75 | 51.61 | 49.70 | 51.55 | 37.14 | 37.21 | 54.35 | 66.03 | 65.42 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.99 | 7.20 | 7.36 |
| **CaO** | 21.48 | 21.98 | 21.59 | 22.24 | 21.66 | 0.27 | 0.26 | 11.10 | 1.47 | 1.47 |
| **TiO2** | 0.49 | 0.50 | 0.54 | 0.68 | 0.55 | 0.03 | 0.02 | 0.03 | 0.01 | 0.04 |
| **MnO** | 0.31 | 0.28 | 0.35 | 0.26 | 0.27 | 0.81 | 0.72 | 0.00 | 0.00 | 0.01 |
| **FeOt** | 8.94 | 8.04 | 9.21 | 8.82 | 8.78 | 30.64 | 30.41 | 0.68 | 0.31 | 0.22 |
| **Total** | 99.97 | 100.16 | 100.40 | 99.91 | 100.16 | 100.37 | 99.86 | 100.09 | 101.44 | 100.48 |

| Date Analysed | 10.11.24 | 10.11.24 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | AT1.w4.c3 | AT1.w6.c1 | LPC1.1.1 | LPC1.1.2 | LPC1.1.3 | LPC1.1.4 | LPC1.2.1 | LPC1.2.2 | LPC1.2.3 | LPC1.2.4 |
| | feld | feld | cpx | feld | ol | ol | cpx | cpx | cpx | cpx |
| **Na2O** | 4.92 | 5.06 | 0.37 | 4.95 | 0.01 | 0.01 | 0.45 | 0.32 | 0.35 | 0.31 |
| **MgO** | 0.01 | 0.00 | 14.14 | 0.07 | 32.73 | 32.22 | 13.67 | 15.12 | 13.93 | 14.79 |
| **Al2O3** | 20.59 | 18.48 | 2.47 | 27.41 | 0.00 | 0.00 | 2.80 | 3.02 | 4.09 | 3.28 |
| **SiO2** | 65.60 | 63.04 | 51.63 | 55.49 | 36.86 | 37.00 | 50.92 | 51.78 | 49.64 | 51.27 |
| **K2O** | 8.26 | 7.62 | 0.00 | 1.42 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| **CaO** | 1.25 | 1.16 | 21.68 | 10.02 | 0.31 | 0.30 | 21.63 | 22.74 | 22.56 | 22.51 |
| **TiO2** | 0.06 | 0.06 | 0.47 | 0.05 | 0.01 | 0.01 | 0.55 | 0.42 | 0.73 | 0.48 |
| **MnO** | 0.05 | 0.00 | 0.36 | 0.00 | 0.86 | 0.78 | 0.32 | 0.16 | 0.17 | 0.21 |
| **FeOt** | 0.25 | 0.23 | 8.80 | 0.86 | 29.66 | 30.07 | 9.18 | 6.61 | 8.24 | 7.07 |
| **Total** | 100.99 | 95.65 | 99.93 | 100.28 | 100.45 | 100.39 | 99.52 | 100.18 | 99.71 | 99.91 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | LPC1.3.1 | LPC1.5.1 | LPC1.5.2 | LPC1.5.3 | LPC1.6.1 | LPC1.6.2 | LPC1.6.3 | LPC1.6.4 | LPC1.8.1 | LPC1.9.1 |
| | cpx | feld | feld | feld | cpx | feld | ol | feld | ol | feld |
| **Na2O** | 0.14 | 5.04 | 5.09 | 4.55 | 0.34 | 3.52 | 0.00 | 5.07 | 0.01 | 5.16 |
| **MgO** | 17.27 | 0.03 | 0.05 | 0.05 | 14.25 | 1.06 | 31.77 | 0.06 | 31.86 | 0.06 |
| **Al2O3** | 1.30 | 27.10 | 26.59 | 28.04 | 3.55 | 18.76 | 0.01 | 26.83 | 0.00 | 26.84 |
| **SiO2** | 53.55 | 56.31 | 56.67 | 54.64 | 50.69 | 59.39 | 37.19 | 56.65 | 35.14 | 56.59 |
| **K2O** | 0.01 | 1.74 | 1.82 | 1.25 | 0.02 | 6.72 | 0.00 | 1.69 | 0.01 | 1.82 |
| **CaO** | 22.91 | 9.19 | 9.05 | 10.79 | 22.60 | 3.30 | 0.31 | 9.25 | 0.29 | 8.97 |
| **TiO2** | 0.20 | 0.06 | 0.04 | 0.06 | 0.59 | 0.63 | 0.00 | 0.03 | 0.00 | 0.06 |
| **MnO** | 0.13 | 0.00 | 0.00 | 0.00 | 0.19 | 0.15 | 0.83 | 0.02 | 0.81 | 0.04 |
| **FeOt** | 3.98 | 0.64 | 0.61 | 0.63 | 7.56 | 5.91 | 29.66 | 0.64 | 29.24 | 0.61 |
| **Total** | 99.48 | 100.12 | 99.93 | 100.01 | 99.79 | 99.44 | 99.76 | 100.24 | 97.35 | 100.15 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | LPC1.9.2 | LPC2.1.1 | LPC2.1.2 | LPC2.1.3 | LPC2.1.4 | LPC2.1.5 | LPC2.1.6 | LPC2.1.7 | LPC2.2.1 | LPC2.2.2 |
| | ol | ol | ol | ol | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.02 | 0.02 | 0.01 | 0.02 | 0.21 | 0.27 | 0.39 | 0.21 | 0.46 | 0.25 |
| MgO | 32.70 | 31.29 | 31.18 | 31.37 | 16.16 | 16.16 | 14.44 | 16.61 | 13.73 | 15.05 |
| Al2O3 | 0.00 | 0.00 | 0.01 | 0.00 | 2.27 | 2.26 | 2.69 | 1.69 | 2.58 | 2.95 |
| SiO2 | 37.22 | 37.06 | 36.78 | 36.79 | 52.23 | 52.56 | 51.47 | 53.47 | 51.42 | 51.88 |
| K2O | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 |
| CaO | 0.52 | 0.30 | 0.31 | 0.30 | 23.62 | 23.48 | 22.04 | 22.60 | 21.67 | 23.53 |
| TiO2 | 0.02 | 0.00 | 0.01 | 0.01 | 0.35 | 0.32 | 0.52 | 0.26 | 0.49 | 0.45 |
| MnO | 0.76 | 0.75 | 0.81 | 0.79 | 0.13 | 0.13 | 0.20 | 0.15 | 0.29 | 0.13 |
| FeOt | 29.15 | 31.11 | 30.73 | 30.82 | 4.51 | 4.43 | 7.43 | 5.40 | 8.85 | 5.98 |
| Total | 100.40 | 100.52 | 99.84 | 100.11 | 99.48 | 99.61 | 99.18 | 100.40 | 99.50 | 100.23 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | LPC2.2.3 | LPC2.2.4 | LPC2.3.1 | LPC2.3.2 | LPC2.4.1 | LPC2.4.2 | LPC2.4.3 | LPC2.4.4 | LPC2.5.1 | LPC2.10.1 |
| | cpx | cpx | feld | feld | cpx | cpx | cpx | cpx | cpx | feld |
| Na2O | 0.42 | 0.45 | 5.36 | 3.18 | 0.43 | 0.22 | 0.24 | 0.43 | 0.44 | 4.94 |
| MgO | 14.20 | 14.03 | 0.05 | 0.00 | 13.74 | 15.56 | 15.76 | 13.96 | 13.87 | 0.06 |
| Al2O3 | 2.51 | 2.71 | 25.67 | 20.16 | 2.80 | 2.67 | 2.45 | 2.59 | 2.44 | 26.89 |
| SiO2 | 51.75 | 51.60 | 58.03 | 63.46 | 51.27 | 51.76 | 51.96 | 50.20 | 51.67 | 55.60 |
| K2O | 0.00 | 0.00 | 2.61 | 10.83 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 1.53 |
| CaO | 21.71 | 21.78 | 7.62 | 1.06 | 21.60 | 23.50 | 23.50 | 21.73 | 21.58 | 9.62 |
| TiO2 | 0.45 | 0.49 | 0.07 | 0.08 | 0.47 | 0.40 | 0.38 | 0.51 | 0.49 | 0.02 |
| MnO | 0.30 | 0.33 | 0.00 | 0.02 | 0.29 | 0.10 | 0.18 | 0.28 | 0.33 | 0.00 |
| FeOt | 8.76 | 9.05 | 0.57 | 0.35 | 8.97 | 5.30 | 5.19 | 8.64 | 9.10 | 0.61 |
| Total | 100.09 | 100.46 | 99.97 | 99.14 | 99.58 | 99.53 | 99.67 | 98.35 | 99.92 | 99.27 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | LPC2.9.1 | LPC2.9.3 | LPC2.9.4 | LPC2.9.5 | LPC2.9.6 | LPC2.8.1 | LPC2.7.1 | LPC2.7.2 | LPC2.7.3 | LPC2.7.4 |
| | cpx | cpx | cpx | cpx | cpx | feld | cpx | cpx | cpx | feld |
| Na2O | 0.33 | 0.44 | 0.27 | 0.18 | 0.19 | 3.16 | 0.41 | 0.39 | 0.46 | 5.15 |
| MgO | 15.53 | 13.99 | 15.63 | 17.10 | 16.89 | 0.76 | 14.72 | 13.49 | 13.22 | 0.14 |
| Al2O3 | 1.47 | 2.65 | 2.72 | 1.46 | 1.25 | 18.61 | 1.56 | 3.38 | 3.97 | 26.30 |
| SiO2 | 52.70 | 51.26 | 51.68 | 53.63 | 53.59 | 60.51 | 52.58 | 50.26 | 50.30 | 56.76 |
| K2O | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 5.51 | 0.01 | 0.00 | 0.01 | 1.87 |
| CaO | 22.28 | 21.69 | 23.43 | 22.86 | 23.03 | 1.99 | 21.07 | 22.09 | 21.85 | 8.88 |
| TiO2 | 0.30 | 0.50 | 0.45 | 0.21 | 0.21 | 0.60 | 0.34 | 0.66 | 0.61 | 0.11 |
| MnO | 0.26 | 0.30 | 0.12 | 0.10 | 0.13 | 0.11 | 0.35 | 0.22 | 0.36 | 0.02 |
| FeOt | 6.81 | 8.41 | 5.07 | 4.46 | 4.43 | 5.26 | 9.00 | 8.66 | 8.93 | 1.30 |
| Total | 99.70 | 99.24 | 99.37 | 100.01 | 99.73 | 96.51 | 100.05 | 99.15 | 99.71 | 100.53 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| Label | LPC2.7.5 | LPC2.7.6 | LPC2.6.1 | LPC2.6.2 | S38e.2.1 | S38e.4.1 | S38e.5.1 | S38e.10.1 | S38e.10.2 | S38e.8.1 |
| | cpx | ol | cpx | cpx | cpx | cpx | feld | feld | cpx | cpx |
| Na2O | 0.37 | 0.00 | 0.46 | 0.43 | 0.26 | 0.24 | 2.33 | 3.09 | 0.24 | 0.26 |
| MgO | 14.74 | 31.53 | 13.76 | 13.24 | 15.04 | 16.34 | 0.08 | 0.04 | 16.28 | 15.13 |
| Al2O3 | 2.22 | 0.00 | 3.22 | 3.98 | 3.77 | 1.71 | 14.20 | 14.46 | 2.52 | 3.57 |
| SiO2 | 52.25 | 36.37 | 51.01 | 49.44 | 51.14 | 52.41 | 74.47 | 74.74 | 52.78 | 50.90 |
| K2O | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 5.22 | 4.54 | 0.01 | 0.01 |
| CaO | 22.48 | 0.31 | 22.25 | 22.32 | 23.09 | 22.70 | 0.65 | 0.57 | 23.63 | 23.15 |
| TiO2 | 0.33 | 0.01 | 0.60 | 0.64 | 0.65 | 0.29 | 0.15 | 0.14 | 0.40 | 0.57 |
| MnO | 0.23 | 0.82 | 0.27 | 0.26 | 0.16 | 0.18 | 0.04 | 0.05 | 0.07 | 0.13 |
| FeOt | 7.09 | 30.32 | 8.78 | 8.42 | 6.19 | 5.66 | 2.03 | 1.78 | 4.59 | 6.41 |
| Total | 99.73 | 99.36 | 100.36 | 98.73 | 100.29 | 99.54 | 99.15 | 99.40 | 100.53 | 100.12 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| **Eruptive Unit** | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| **Label** | S38e.7.1 | S38e.11.1 | S38e.11.2 | S38e.11.3 | S38e.11.4 | S38e.15.1 | CA5.19.c1a | CA5.19.c1b | CA5.19.c1c | CA5.23.c1a1 |
| | ol | feld | cpx | cpx | cpx | cpx | feld | feld | feld | feld |
| **Na2O** | 0.00 | 2.41 | 0.18 | 0.24 | 0.17 | 0.36 | 4.29 | 4.37 | 4.04 | 4.38 |
| **MgO** | 33.99 | 0.06 | 16.40 | 16.26 | 17.41 | 13.77 | 0.03 | 0.03 | 0.03 | 0.07 |
| **Al2O3** | 0.01 | 13.69 | 2.49 | 2.43 | 1.36 | 3.02 | 29.47 | 29.12 | 29.62 | 28.50 |
| **SiO2** | 36.76 | 74.80 | 52.69 | 52.90 | 53.98 | 51.16 | 53.39 | 53.72 | 53.39 | 54.57 |
| **K2O** | 0.02 | 5.02 | 0.01 | 0.00 | 0.00 | 0.02 | 0.49 | 0.50 | 0.42 | 0.97 |
| **CaO** | 0.34 | 0.60 | 23.73 | 23.35 | 22.67 | 20.96 | 11.77 | 11.47 | 12.08 | 10.96 |
| **TiO2** | 0.00 | 0.14 | 0.37 | 0.34 | 0.23 | 0.56 | 0.05 | 0.02 | 0.04 | 0.05 |
| **MnO** | 0.66 | 0.07 | 0.07 | 0.07 | 0.13 | 0.37 | 0.02 | 0.00 | 0.00 | 0.00 |
| **FeOt** | 28.44 | 1.75 | 4.33 | 4.66 | 4.43 | 9.92 | 0.73 | 0.72 | 0.73 | 0.60 |
| **Total** | 100.24 | 98.53 | 100.28 | 100.25 | 100.39 | 100.14 | 100.24 | 99.94 | 100.36 | 100.09 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.08.23 | 10.08.23 | 10.08.23 |
| **Eruptive Unit** | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| **Label** | CA5.23.c1b | CA5.24.c1a | CA5.3.c1 | CA5.5.c1 | CA5.7.c1 | CA5.7.c2 | CA5.8.c1 | AT14.1.1 | AT14.10.1 | AT14.2.1 |
| | feld | feld | feld | cpx | feld | feld | feld | feld | feld | feld |
| **Na2O** | 3.24 | 4.72 | 4.81 | 0.31 | 3.02 | 4.64 | 2.97 | 3.58 | 6.66 | 2.72 |
| **MgO** | 0.06 | 0.06 | 0.05 | 14.95 | 1.18 | 0.06 | 1.23 | 0.07 | 0.00 | 0.01 |
| **Al2O3** | 30.63 | 27.92 | 27.69 | 2.59 | 17.88 | 27.82 | 18.18 | 13.46 | 18.06 | 13.13 |
| **SiO2** | 51.14 | 55.08 | 56.35 | 51.93 | 61.26 | 55.19 | 61.39 | 76.38 | 70.10 | 73.21 |
| **K2O** | 0.51 | 1.24 | 1.38 | 0.01 | 6.11 | 1.11 | 6.15 | 2.45 | 4.15 | 7.53 |
| **CaO** | 13.58 | 9.89 | 9.78 | 22.70 | 2.82 | 10.45 | 2.96 | 1.35 | 1.21 | 0.42 |
| **TiO2** | 0.03 | 0.01 | 0.04 | 0.39 | 0.55 | 0.03 | 0.56 | 0.10 | 0.05 | 0.13 |
| **MnO** | 0.00 | 0.01 | 0.03 | 0.18 | 0.11 | 0.02 | 0.17 | 0.08 | 0.00 | 0.03 |
| **FeOt** | 0.59 | 0.64 | 0.67 | 6.92 | 5.55 | 0.59 | 5.50 | 1.74 | 0.93 | 1.35 |
| **Total** | 99.78 | 99.58 | 100.80 | 99.97 | 98.50 | 99.91 | 99.10 | 99.20 | 101.17 | 98.54 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
| **Eruptive Unit** | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda | Commenda |
| **Label** | AT14.4.1 | AT14.4.2 | AT14.4.3 | AT14.4.4 | AT14.5.2 | AT14.5.3 | AT14.5.4 | AT14.5.7 | AT14.7.1 | AT14.7.2 |
| | feld | feld | feld | feld | feld | feld | feld | feld | feld | feld |
| **Na2O** | 4.67 | 4.71 | 1.26 | 2.19 | 6.20 | 2.77 | 6.95 | 2.28 | 2.94 | 2.72 |
| **MgO** | 0.00 | 0.00 | 0.11 | 0.00 | 0.02 | 0.05 | 0.00 | 0.08 | 0.01 | 0.05 |
| **Al2O3** | 19.37 | 19.23 | 10.60 | 13.37 | 19.65 | 18.48 | 20.36 | 15.74 | 17.44 | 13.51 |
| **SiO2** | 65.74 | 66.28 | 77.94 | 75.33 | 64.95 | 65.84 | 66.70 | 71.41 | 66.17 | 75.04 |
| **K2O** | 10.33 | 10.09 | 6.56 | 8.31 | 7.58 | 12.34 | 6.68 | 10.55 | 11.69 | 7.87 |
| **CaO** | 0.40 | 0.41 | 0.58 | 0.26 | 0.71 | 0.27 | 0.86 | 0.37 | 0.34 | 0.26 |
| **TiO2** | 0.03 | 0.02 | 0.11 | 0.15 | 0.08 | 0.08 | 0.06 | 0.05 | 0.08 | 0.23 |
| **MnO** | 0.00 | 0.00 | 0.05 | 0.02 | 0.04 | 0.00 | 0.02 | 0.06 | 0.01 | 0.02 |
| **FeOt** | 0.12 | 0.19 | 1.63 | 1.96 | 0.35 | 0.87 | 0.27 | 1.17 | 0.83 | 0.94 |
| **Total** | 100.67 | 100.93 | 98.85 | 101.58 | 99.56 | 100.70 | 101.90 | 101.71 | 99.51 | 100.65 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.23 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| **Eruptive Unit** | Commenda | Commenda | Commenda | Commenda | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | AT14.7.3 | AT14.1 | AT14.11 | AT14.8 | ULC079.1.c | ULC079.1.c | ULC079.10.c | ULC079.10.c | ULC079.11 | ULC079.11. |
| | feld | feld | feld | feld | cpx | cpx | feld | feld | cpx | ol |
| **Na2O** | 2.60 | 3.04 | 1.70 | 3.31 | 0.35 | 0.26 | 6.32 | 6.21 | 0.31 | 0.00 |
| **MgO** | 0.00 | 0.04 | 0.02 | 0.03 | 13.46 | 13.70 | 0.02 | 0.02 | 13.97 | 25.66 |
| **Al2O3** | 17.23 | 14.17 | 13.02 | 13.23 | 1.05 | 0.92 | 24.00 | 24.65 | 4.40 | 0.00 |
| **SiO2** | 63.68 | 76.64 | 76.49 | 78.43 | 51.97 | 51.93 | 59.99 | 59.66 | 49.62 | 36.25 |
| **K2O** | 12.43 | 3.85 | 3.92 | 5.71 | 0.02 | 0.02 | 1.94 | 1.80 | 0.00 | 0.00 |
| **CaO** | 0.16 | 0.53 | 0.45 | 0.51 | 18.78 | 17.94 | 6.70 | 7.06 | 22.67 | 0.22 |
| **TiO2** | 0.12 | 0.09 | 0.07 | 0.05 | 0.21 | 0.22 | 0.03 | 0.03 | 0.75 | 0.01 |
| **MnO** | 0.00 | 0.03 | 0.00 | 0.00 | 0.80 | 0.77 | 0.02 | 0.00 | 0.17 | 1.16 |
| **FeOt** | 0.66 | 1.50 | 0.46 | 0.29 | 12.89 | 13.34 | 0.30 | 0.28 | 7.66 | 36.95 |
| **Total** | 96.87 | 99.89 | 96.13 | 101.56 | 99.53 | 99.10 | 99.31 | 99.71 | 99.56 | 100.25 |

| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | ULC079.12 | LC079.13.c | LC079.13.c | LC079.13.c | LC079.14.c | LC079.14.c | LC079.14.c | LC079.14.c | /ULC079.2. | JLC079.2.c2 |
| | cpx | feld | feld | feld | cpx | cpx | feld | feld | feld | cpx |
| Na2O | 0.48 | 4.66 | 4.80 | 4.77 | 0.42 | 0.27 | 3.90 | 3.89 | 5.27 | 0.39 |
| MgO | 12.56 | 0.06 | 0.06 | 0.05 | 13.71 | 15.24 | 0.00 | 0.00 | 0.04 | 14.10 |
| Al2O3 | 4.76 | 27.37 | 27.09 | 27.15 | 3.21 | 2.06 | 19.16 | 19.21 | 26.23 | 3.04 |
| SiO2 | 49.22 | 54.80 | 55.37 | 55.53 | 50.50 | 52.21 | 65.91 | 65.99 | 57.74 | 51.18 |
| K2O | 0.01 | 0.87 | 0.96 | 0.92 | 0.00 | 0.01 | 10.69 | 10.75 | 1.66 | 0.02 |
| CaO | 20.96 | 10.57 | 10.12 | 9.98 | 21.96 | 22.95 | 0.58 | 0.54 | 8.24 | 21.76 |
| TiO2 | 0.91 | 0.00 | 0.04 | 0.00 | 0.58 | 0.33 | 0.01 | 0.01 | 0.01 | 0.42 |
| MnO | 0.33 | 0.00 | 0.02 | 0.01 | 0.25 | 0.18 | 0.00 | 0.01 | 0.00 | 0.27 |
| FeOt | 10.31 | 0.63 | 0.53 | 0.61 | 8.66 | 6.58 | 0.15 | 0.09 | 0.59 | 8.50 |
| Total | 99.53 | 98.98 | 98.99 | 99.03 | 99.29 | 99.83 | 100.39 | 100.49 | 99.79 | 99.67 |
| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | JLC079.2.c2 | JLC079.4.c1 | JLC079.4.c1 | JLC079.4.c1 | JLC079.4.c2 | JLC079.4.c2 | JLC079.4.c3 | JLC079.4.c3 | /ULC079.5. | /ULC079.5. |
| | cpx | cpx | cpx | cpx | cpx | cpx | feld | feld | cpx | cpx |
| Na2O | 0.41 | 0.36 | 0.35 | 0.32 | 0.38 | 0.31 | 3.66 | 3.80 | 0.39 | 0.42 |
| MgO | 13.67 | 13.84 | 14.41 | 13.98 | 13.97 | 14.35 | 0.00 | 0.00 | 12.90 | 13.10 |
| Al2O3 | 3.54 | 3.79 | 4.07 | 4.62 | 2.95 | 2.73 | 19.01 | 19.39 | 4.39 | 3.16 |
| SiO2 | 50.22 | 50.34 | 50.22 | 49.52 | 51.01 | 50.84 | 66.09 | 66.20 | 49.30 | 50.06 |
| K2O | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 10.98 | 11.06 | 0.03 | 0.02 |
| CaO | 21.23 | 22.13 | 22.33 | 22.59 | 21.83 | 21.83 | 0.38 | 0.42 | 21.16 | 20.83 |
| TiO2 | 0.49 | 0.56 | 0.70 | 0.86 | 0.45 | 0.49 | 0.02 | 0.01 | 0.80 | 0.60 |
| MnO | 0.36 | 0.27 | 0.15 | 0.20 | 0.25 | 0.23 | 0.00 | 0.02 | 0.28 | 0.39 |
| FeOt | 9.52 | 8.72 | 7.74 | 7.69 | 8.21 | 7.97 | 0.12 | 0.11 | 10.13 | 10.44 |
| Total | 99.45 | 100.01 | 99.96 | 99.79 | 99.06 | 98.76 | 100.25 | 101.02 | 99.39 | 99.03 |
| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | /ULC079.5. | /ULC079.5. | /ULC079.6. | /ULC079.9. | VULC54.1.c | /ULC54.10. | /ULC54.10. | VULC54.3.c | VULC54.3.c | VULC54.4.c |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.40 | 0.38 | 0.30 | 0.31 | 0.38 | 0.28 | 0.33 | 0.31 | 0.41 | 0.32 |
| MgO | 13.78 | 13.83 | 14.80 | 14.63 | 14.16 | 14.26 | 14.84 | 14.97 | 13.87 | 14.76 |
| Al2O3 | 3.27 | 3.71 | 2.48 | 3.59 | 2.16 | 3.71 | 1.91 | 2.79 | 3.62 | 3.51 |
| SiO2 | 50.60 | 50.21 | 51.76 | 50.62 | 51.84 | 49.86 | 52.07 | 51.79 | 50.80 | 50.70 |
| K2O | 0.01 | 0.01 | 0.03 | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| CaO | 21.56 | 21.66 | 21.82 | 22.30 | 21.43 | 22.42 | 21.26 | 22.91 | 22.35 | 22.38 |
| TiO2 | 0.56 | 0.62 | 0.42 | 0.52 | 0.44 | 0.64 | 0.36 | 0.42 | 0.59 | 0.51 |
| MnO | 0.27 | 0.24 | 0.28 | 0.17 | 0.34 | 0.19 | 0.40 | 0.17 | 0.22 | 0.10 |
| FeOt | 9.25 | 8.73 | 7.65 | 7.64 | 9.16 | 7.74 | 9.19 | 6.56 | 8.24 | 7.39 |
| Total | 99.70 | 99.41 | 99.54 | 99.79 | 99.92 | 99.10 | 100.36 | 99.94 | 100.10 | 99.68 |
| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | VULC54.4.c | VULC54.4.c | VULC54.5.c | VULC54.5.c | VULC54.5.c | VULC54.6.c | VULC54.7.c | VULC54.7.c | ULC54.7.c3 | ULC54.7.c3 |
| | cpx | cpx | cpx | cpx | cpx | feld | cpx | cpx | cpx | cpx |
| Na2O | 0.36 | 0.23 | 0.27 | 0.34 | 0.44 | 4.77 | 0.32 | 0.29 | 0.33 | 0.44 |
| MgO | 13.36 | 15.48 | 14.37 | 14.33 | 13.74 | 0.06 | 13.98 | 14.23 | 14.14 | 13.84 |
| Al2O3 | 1.91 | 2.24 | 3.56 | 2.47 | 3.46 | 27.56 | 4.32 | 4.37 | 3.79 | 3.07 |
| SiO2 | 51.49 | 51.91 | 50.85 | 51.47 | 50.49 | 55.79 | 49.85 | 49.81 | 50.36 | 51.16 |
| K2O | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 1.28 | 0.00 | 0.01 | 0.00 | 0.00 |
| CaO | 20.42 | 21.35 | 22.94 | 21.59 | 22.00 | 9.75 | 22.46 | 22.46 | 22.66 | 22.09 |
| TiO2 | 0.38 | 0.42 | 0.56 | 0.39 | 0.56 | 0.06 | 0.79 | 0.79 | 0.56 | 0.54 |
| MnO | 0.52 | 0.21 | 0.16 | 0.34 | 0.26 | 0.00 | 0.18 | 0.17 | 0.19 | 0.30 |
| FeOt | 11.21 | 8.19 | 7.47 | 8.67 | 8.87 | 0.63 | 8.17 | 7.49 | 7.86 | 8.58 |
| Total | 99.70 | 100.03 | 100.18 | 99.60 | 99.81 | 99.90 | 100.08 | 99.62 | 99.89 | 100.02 |

| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | ULC54.7.c3 | VULC24.1.c | VULC24.1.c | VULC24.1.c | ULC24.12. | VULC24.2.c | VULC24.2.c | VULC24.3.c | VULC24.3.c | VULC24.3.c |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.35 | 0.33 | 0.32 | 0.21 | 0.34 | 0.33 | 0.40 | 0.30 | 0.26 | 0.21 |
| MgO | 14.00 | 14.25 | 14.64 | 15.80 | 13.77 | 14.42 | 12.98 | 13.63 | 16.21 | 15.67 |
| Al2O3 | 3.69 | 3.84 | 3.72 | 1.99 | 4.44 | 2.53 | 1.11 | 5.08 | 1.84 | 2.21 |
| SiO2 | 50.61 | 50.17 | 50.92 | 52.54 | 50.20 | 51.81 | 51.99 | 49.47 | 52.79 | 52.41 |
| K2O | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| CaO | 22.50 | 22.77 | 22.77 | 21.78 | 22.49 | 21.47 | 19.71 | 22.32 | 21.58 | 21.73 |
| TiO2 | 0.56 | 0.57 | 0.50 | 0.34 | 0.62 | 0.41 | 0.27 | 0.92 | 0.31 | 0.35 |
| MnO | 0.23 | 0.12 | 0.18 | 0.18 | 0.20 | 0.36 | 0.67 | 0.21 | 0.20 | 0.17 |
| FeOt | 7.77 | 7.44 | 7.04 | 7.19 | 8.37 | 8.86 | 13.13 | 8.64 | 7.10 | 7.45 |
| Total | 99.72 | 99.50 | 100.10 | 100.04 | 100.43 | 100.22 | 100.26 | 100.58 | 100.30 | 100.21 |
| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | VULC24.4.c | VULC24.4.c | VULC24.4.c | VULC24.5.c | VULC24.5.c | VULC24.6.c | VULC24.6.c | VULC24.8.c | VULC24.8.c | VULC24.8.c |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | ol | ol | feld |
| Na2O | 0.30 | 0.42 | 0.37 | 0.41 | 0.49 | 0.39 | 0.39 | 0.00 | 0.00 | 4.86 |
| MgO | 14.51 | 13.77 | 14.44 | 13.73 | 13.48 | 13.38 | 13.23 | 31.27 | 27.36 | 0.01 |
| Al2O3 | 3.65 | 2.87 | 2.24 | 3.62 | 3.73 | 3.83 | 4.00 | 0.01 | 0.00 | 21.48 |
| SiO2 | 50.60 | 51.36 | 52.09 | 50.90 | 50.70 | 50.36 | 49.89 | 36.82 | 35.82 | 63.10 |
| K2O | 0.00 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.14 |
| CaO | 22.52 | 21.74 | 21.47 | 21.93 | 21.91 | 22.33 | 22.24 | 0.23 | 0.22 | 2.58 |
| TiO2 | 0.59 | 0.46 | 0.38 | 0.72 | 0.66 | 0.64 | 0.73 | 0.00 | 0.01 | 0.07 |
| MnO | 0.14 | 0.28 | 0.43 | 0.25 | 0.26 | 0.24 | 0.25 | 0.92 | 1.15 | 0.00 |
| FeOt | 7.64 | 9.16 | 8.71 | 8.62 | 9.24 | 8.97 | 8.77 | 31.49 | 35.95 | 0.46 |
| Total | 99.96 | 100.06 | 100.18 | 100.20 | 100.46 | 100.13 | 99.51 | 100.76 | 100.50 | 99.71 |
| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | VULC24.8.c | VULC24.8.c | VULC24.8.c | VULC24.8.c | ULC24.9.c1 | ULC24.9.c1 | JLC41.1.1c | JLC41.1.1c | JLC41.1.1c | ULC41.1.1ri |
| | cpx | ol | cpx | cpx | feld | feld | feld | feld | feld | feld |
| Na2O | 0.32 | 0.04 | 0.35 | 0.42 | 4.13 | 3.82 | 5.59 | 4.77 | 4.56 | 3.85 |
| MgO | 14.23 | 28.42 | 14.34 | 13.89 | 0.06 | 0.05 | 0.03 | 0.04 | 0.05 | 0.01 |
| Al2O3 | 4.00 | 0.00 | 3.14 | 3.23 | 28.73 | 29.10 | 25.88 | 27.79 | 28.11 | 20.13 |
| SiO2 | 50.36 | 35.89 | 51.50 | 50.82 | 53.65 | 52.84 | 57.80 | 54.95 | 54.46 | 65.09 |
| K2O | 0.00 | 0.00 | 0.00 | 0.01 | 0.77 | 0.63 | 1.47 | 0.80 | 0.74 | 9.56 |
| CaO | 22.76 | 0.22 | 22.28 | 22.18 | 11.50 | 12.34 | 8.06 | 10.26 | 10.90 | 1.26 |
| TiO2 | 0.54 | 0.00 | 0.51 | 0.59 | 0.06 | 0.02 | 0.07 | 0.07 | 0.02 | 0.13 |
| MnO | 0.16 | 1.11 | 0.25 | 0.28 | 0.00 | 0.04 | 0.00 | 0.01 | 0.03 | 0.00 |
| FeOt | 8.00 | 35.66 | 8.05 | 9.04 | 0.54 | 0.62 | 0.52 | 0.63 | 0.64 | 0.44 |
| Total | 100.38 | 101.32 | 100.43 | 100.46 | 99.44 | 99.47 | 99.42 | 99.31 | 99.52 | 100.45 |
| Date Analysed | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | JLC41.1.1ri | JLC41.1.1ri | ULC41.1.c2 | ULC41.1.c2 | ULC41.1.c3 | ULC41.1.c3 | /ULC41.10. | /ULC41.11. | /ULC41.13. | /ULC41.14. |
| | feld | feld | cpx | cpx | cpx | cpx | cpx | feld | cpx | feld |
| Na2O | 3.76 | 3.99 | 0.42 | 0.46 | 0.34 | 0.34 | 0.32 | 4.63 | 0.45 | 3.57 |
| MgO | 0.01 | 0.00 | 13.97 | 13.10 | 14.15 | 13.70 | 14.61 | 0.03 | 13.37 | 0.00 |
| Al2O3 | 19.88 | 20.16 | 1.84 | 1.94 | 3.80 | 4.24 | 3.88 | 27.12 | 3.82 | 19.05 |
| SiO2 | 64.63 | 63.18 | 51.98 | 51.40 | 50.13 | 49.41 | 50.74 | 54.81 | 50.35 | 66.16 |
| K2O | 9.80 | 9.23 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 1.09 | 0.00 | 11.13 |
| CaO | 1.00 | 1.38 | 20.98 | 20.90 | 22.16 | 21.95 | 22.72 | 10.42 | 22.09 | 0.45 |
| TiO2 | 0.10 | 0.09 | 0.34 | 0.33 | 0.61 | 0.69 | 0.64 | 0.03 | 0.69 | 0.02 |
| MnO | 0.03 | 0.00 | 0.46 | 0.49 | 0.21 | 0.21 | 0.18 | 0.00 | 0.20 | 0.00 |
| FeOt | 0.28 | 0.34 | 10.22 | 11.42 | 8.49 | 8.88 | 6.95 | 0.60 | 8.74 | 0.11 |
| Total | 99.50 | 98.38 | 100.20 | 100.06 | 99.89 | 99.42 | 100.03 | 98.73 | 99.73 | 100.49 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | VULC41.15. | ULC41.2.c1 | ULC41.2.c1 | VULC41.2.c | VULC41.3.c | VULC41.3.c | VULC41.3.c | VULC41.4.c | VULC41.4.c | VULC41.5.c |
| | feld | cpx | cpx | cpx | cpx | cpx | cpx | cpx | feld | cpx |
| **Na2O** | 3.74 | 0.47 | 0.29 | 0.39 | 0.27 | 0.29 | 0.47 | 0.32 | 5.42 | 0.40 |
| **MgO** | 0.00 | 12.97 | 14.58 | 14.32 | 14.07 | 14.97 | 13.42 | 13.31 | 0.03 | 13.84 |
| **Al2O3** | 18.96 | 4.15 | 3.97 | 3.14 | 4.11 | 2.38 | 3.48 | 1.19 | 25.90 | 3.06 |
| **SiO2** | 66.03 | 49.79 | 50.11 | 51.21 | 49.97 | 52.06 | 50.92 | 52.29 | 57.43 | 50.63 |
| **K2O** | 10.93 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 1.50 | 0.01 |
| **CaO** | 0.49 | 21.99 | 22.79 | 22.26 | 22.77 | 21.72 | 22.13 | 18.53 | 8.19 | 22.12 |
| **TiO2** | 0.01 | 0.77 | 0.79 | 0.54 | 0.75 | 0.39 | 0.64 | 0.31 | 0.02 | 0.56 |
| **MnO** | 0.00 | 0.27 | 0.12 | 0.20 | 0.16 | 0.20 | 0.25 | 0.70 | 0.03 | 0.27 |
| **FeOt** | 0.08 | 9.08 | 6.33 | 7.68 | 7.27 | 8.23 | 8.72 | 13.65 | 0.51 | 8.73 |
| **Total** | 100.25 | 99.49 | 98.99 | 99.74 | 99.38 | 100.26 | 100.04 | 100.30 | 99.05 | 99.61 |
| **Date Analysed** | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | VULC41.5.c | VULC41.6.c | VULC41.6.c | VULC41.7.c | ULC41.8.c1 | ULC41.8.c1 | ULC41.8.c1 | VULC41.9.c | VULC41.9.c | 33,10-15.2.c |
| | cpx | feld | feld | cpx | cpx | cpx | cpx | cpx | cpx | feld |
| **Na2O** | 0.34 | 5.31 | 4.46 | 0.45 | 0.39 | 0.46 | 0.35 | 0.46 | 0.40 | 2.84 |
| **MgO** | 13.59 | 0.04 | 0.00 | 14.01 | 13.86 | 13.78 | 13.34 | 13.42 | 13.74 | 0.00 |
| **Al2O3** | 4.18 | 24.31 | 19.87 | 2.79 | 4.05 | 3.48 | 4.55 | 2.75 | 3.26 | 20.52 |
| **SiO2** | 49.87 | 57.17 | 65.33 | 51.44 | 50.48 | 50.71 | 49.54 | 51.09 | 51.07 | 61.19 |
| **K2O** | 0.00 | 1.83 | 9.08 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 10.48 |
| **CaO** | 22.74 | 8.02 | 1.30 | 21.53 | 21.79 | 22.07 | 22.49 | 21.29 | 22.07 | 1.05 |
| **TiO2** | 0.65 | 0.05 | 0.12 | 0.52 | 0.68 | 0.61 | 0.71 | 0.53 | 0.52 | 0.12 |
| **MnO** | 0.15 | 0.00 | 0.00 | 0.30 | 0.22 | 0.23 | 0.19 | 0.41 | 0.33 | 0.00 |
| **FeOt** | 8.40 | 0.62 | 0.64 | 8.77 | 8.47 | 8.60 | 8.65 | 9.79 | 8.75 | 0.32 |
| **Total** | 99.92 | 97.35 | 100.80 | 99.81 | 99.95 | 99.95 | 99.83 | 99.74 | 100.14 | 96.52 |
| **Date Analysed** | 10.11.24 | 10.08.23 | 10.08.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | 33,10-15.9.c | S33c.13.1 | S33c.8.1 | Stop33d.1.1 | Stop33d.1.2 | Stop33d.1.3 | Stop33d.1.4 | Stop33d.1.5 | Stop33d.1.6 | Stop33d.1.7 |
| | feld | feld | feld | feld | feld | feld | feld | feld | feld | feld |
| **Na2O** | 2.74 | 2.86 | 5.95 | 2.73 | 2.61 | 2.68 | 2.56 | 2.72 | 4.84 | 2.66 |
| **MgO** | 1.03 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.04 | 0.00 |
| **Al2O3** | 18.69 | 19.98 | 25.54 | 19.18 | 19.00 | 18.80 | 18.91 | 19.26 | 27.31 | 19.62 |
| **SiO2** | 60.50 | 61.79 | 58.27 | 65.99 | 65.72 | 65.81 | 64.28 | 64.37 | 56.48 | 63.50 |
| **K2O** | 6.11 | 11.12 | 2.11 | 12.12 | 11.84 | 11.79 | 11.44 | 11.55 | 1.28 | 11.19 |
| **CaO** | 2.44 | 0.75 | 7.55 | 0.62 | 0.62 | 0.61 | 0.56 | 0.75 | 9.96 | 0.76 |
| **TiO2** | 0.64 | 0.11 | 0.03 | 0.05 | 0.06 | 0.04 | 0.08 | 0.07 | 0.03 | 0.07 |
| **MnO** | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| **FeOt** | 4.86 | 0.38 | 0.44 | 0.15 | 0.13 | 0.22 | 0.21 | 0.19 | 0.45 | 0.23 |
| **Total** | 97.12 | 96.99 | 99.92 | 100.84 | 99.99 | 99.98 | 98.03 | 98.91 | 100.40 | 98.03 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | Stop33d.3.1 | Stop33d.3.2 | Stop33d.3.3 | Stop33d.3.4 | Stop33d.3.5 | Stop33d.4.1 | Stop33d.4.2 | Stop33d.4.3 | Stop33d.4.4 | Stop33d.4.5 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.31 | 0.36 | 0.33 | 0.38 | 0.38 | 0.39 | 0.44 | 0.42 | 0.40 | 0.42 |
| **MgO** | 14.39 | 14.39 | 14.37 | 14.45 | 14.17 | 13.73 | 13.76 | 13.75 | 13.84 | 13.80 |
| **Al2O3** | 2.13 | 2.26 | 2.25 | 1.96 | 2.48 | 2.82 | 2.59 | 2.77 | 2.51 | 2.72 |
| **SiO2** | 52.79 | 52.51 | 52.15 | 52.41 | 51.78 | 51.74 | 51.80 | 51.45 | 51.95 | 51.61 |
| **K2O** | 0.02 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 |
| **CaO** | 22.53 | 21.58 | 22.79 | 22.61 | 21.63 | 22.34 | 22.86 | 22.86 | 22.27 | 22.08 |
| **TiO2** | 0.47 | 0.55 | 0.55 | 0.41 | 0.59 | 0.60 | 0.54 | 0.60 | 0.53 | 0.59 |
| **MnO** | 0.27 | 0.33 | 0.27 | 0.41 | 0.27 | 0.34 | 0.33 | 0.42 | 0.45 | 0.40 |
| **FeOt** | 8.09 | 8.15 | 8.25 | 8.15 | 8.38 | 8.74 | 8.88 | 8.72 | 8.40 | 8.86 |
| **Total** | 100.99 | 100.14 | 100.97 | 100.80 | 99.68 | 100.70 | 101.19 | 101.01 | 100.35 | 100.49 |

| Date Analysed | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | S32B.1.1 | S32B.1.2 | S32B.1.3 | S32B.1.4 | S32B.10.1 | S32B.10.2 | S32B.10.3 | S32B.11.1 | S32B.11.2 | S32B.11.3 |
| | cpx | cpx | ol | feld | cpx | feld | feld | ol | feld | feld |
| **Na2O** | 0.46 | 0.43 | 0.05 | 4.98 | 0.44 | 6.88 | 4.29 | 0.01 | 6.15 | 4.62 |
| **MgO** | 13.86 | 13.58 | 28.95 | 0.01 | 13.76 | 0.01 | 0.00 | 32.55 | 0.05 | 0.05 |
| **Al2O3** | 3.34 | 2.96 | 0.01 | 19.85 | 3.18 | 24.19 | 18.96 | 0.00 | 25.64 | 28.05 |
| **SiO2** | 50.59 | 47.99 | 34.55 | 65.34 | 50.85 | 60.76 | 65.55 | 36.34 | 58.40 | 54.13 |
| **K2O** | 0.07 | 0.01 | 0.04 | 8.82 | 0.03 | 1.75 | 10.29 | 0.00 | 1.62 | 0.93 |
| **CaO** | 21.94 | 21.13 | 0.25 | 1.26 | 21.76 | 6.21 | 0.57 | 0.28 | 7.58 | 10.75 |
| **TiO2** | 0.55 | 0.61 | 0.02 | 0.08 | 0.55 | 0.03 | 0.01 | 0.02 | 0.04 | 0.05 |
| **MnO** | 0.26 | 0.48 | 0.96 | 0.00 | 0.26 | 0.00 | 0.01 | 0.80 | 0.00 | 0.00 |
| **FeOt** | 8.63 | 9.49 | 32.06 | 0.27 | 8.55 | 0.16 | 0.16 | 29.46 | 0.55 | 0.62 |
| **Total** | 99.71 | 96.68 | 96.88 | 100.61 | 99.37 | 99.98 | 99.84 | 99.45 | 100.03 | 99.21 |

| Date Analysed | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | S32B.11.4 | S32B.11.5 | S32B.13.1 | S32B.13.2 | S32B.13.3 | S32B.13.4 | S32B.13.5 | S32B.15.1 | S32B.15.2 | S32B.2.1 |
| | cpx | cpx | cpx | feld | ol | cpx | feld | cpx | cpx | cpx |
| **Na2O** | 0.40 | 0.34 | 0.20 | 4.65 | 0.00 | 0.39 | 5.44 | 0.27 | 0.40 | 0.45 |
| **MgO** | 14.08 | 14.49 | 16.01 | 0.00 | 24.84 | 14.50 | 0.05 | 15.13 | 13.83 | 13.39 |
| **Al2O3** | 1.61 | 3.36 | 3.01 | 19.84 | 0.01 | 1.54 | 26.76 | 2.61 | 2.00 | 3.90 |
| **SiO2** | 51.97 | 51.19 | 51.83 | 65.75 | 35.13 | 52.06 | 55.91 | 51.72 | 51.80 | 49.80 |
| **K2O** | 0.01 | 0.00 | 0.00 | 9.62 | 0.00 | 0.01 | 0.82 | 0.00 | 0.01 | 0.00 |
| **CaO** | 20.81 | 22.66 | 22.95 | 0.93 | 0.18 | 20.27 | 9.48 | 22.35 | 21.18 | 20.96 |
| **TiO2** | 0.28 | 0.46 | 0.39 | 0.03 | 0.01 | 0.31 | 0.03 | 0.44 | 0.38 | 0.69 |
| **MnO** | 0.47 | 0.15 | 0.18 | 0.00 | 1.32 | 0.49 | 0.03 | 0.20 | 0.41 | 0.33 |
| **FeOt** | 9.90 | 7.29 | 5.29 | 0.34 | 38.22 | 9.84 | 0.62 | 7.33 | 9.76 | 10.07 |
| **Total** | 99.53 | 99.94 | 99.86 | 101.16 | 99.71 | 99.41 | 99.14 | 100.05 | 99.77 | 99.60 |

| Date Analysed | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | S32B.2.2 | S32B.2.3 | S32B.3.1 | S32B.4.1 | S32B.4.2 | S32B.4.3 | S32B.5.1 | S32B.5.2 | S32B.5.3 | S32B.5.4 |
| | cpx | cpx | feld | cpx | cpx | feld | feld | cpx | cpx | feld |
| **Na2O** | 0.45 | 0.44 | 3.61 | 0.35 | 0.43 | 7.21 | 6.38 | 0.36 | 0.33 | 4.70 |
| **MgO** | 13.74 | 13.83 | 0.00 | 14.03 | 13.65 | 0.01 | 0.04 | 12.27 | 15.09 | 0.09 |
| **Al2O3** | 3.62 | 4.72 | 19.76 | 2.98 | 3.67 | 24.00 | 24.65 | 3.02 | 1.68 | 27.29 |
| **SiO2** | 50.40 | 49.55 | 65.50 | 51.10 | 50.04 | 62.22 | 59.64 | 49.82 | 52.06 | 54.43 |
| **K2O** | 0.00 | 0.00 | 11.20 | 0.00 | 0.01 | 2.46 | 1.65 | 0.01 | 0.01 | 1.07 |
| **CaO** | 21.65 | 22.22 | 0.72 | 22.37 | 22.23 | 5.27 | 7.15 | 20.91 | 20.08 | 10.42 |
| **TiO2** | 0.60 | 0.71 | 0.06 | 0.49 | 0.63 | 0.02 | 0.05 | 0.61 | 0.33 | 0.03 |
| **MnO** | 0.32 | 0.22 | 0.04 | 0.25 | 0.26 | 0.00 | 0.00 | 0.46 | 0.53 | 0.02 |
| **FeOt** | 8.82 | 7.91 | 0.18 | 8.27 | 8.49 | 0.19 | 0.62 | 11.85 | 9.48 | 0.65 |
| **Total** | 99.60 | 99.59 | 101.06 | 99.84 | 99.41 | 101.37 | 100.18 | 99.33 | 99.58 | 98.69 |

| Date Analysed | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | S32B.6.1 | S32B.6.2 | S32B.7.1 | S32B.7.2 | S32B.7.3 | S32B.7.4 | S32B.7.5 | S32B.8.1 | S32B.8.2 | S32B.9.1 |
| | feld | cpx | feld | cpx | cpx | cpx | cpx | cpx | cpx | feld |
| **Na2O** | 6.87 | 0.27 | 4.24 | 0.47 | 0.45 | 0.46 | 0.45 | 0.36 | 0.26 | 4.89 |
| **MgO** | 0.00 | 15.71 | 0.00 | 13.52 | 13.65 | 12.11 | 12.94 | 14.42 | 8.82 | 0.08 |
| **Al2O3** | 23.49 | 2.20 | 19.30 | 3.95 | 4.08 | 6.22 | 4.99 | 2.72 | 0.50 | 27.10 |
| **SiO2** | 62.93 | 52.21 | 66.07 | 50.08 | 50.23 | 45.90 | 48.53 | 51.50 | 50.45 | 55.31 |
| **K2O** | 3.01 | 0.00 | 10.57 | 0.02 | 0.03 | 0.16 | 0.01 | 0.00 | 0.00 | 1.32 |
| **CaO** | 4.78 | 22.53 | 0.45 | 22.21 | 22.03 | 21.00 | 21.37 | 21.87 | 19.11 | 10.04 |
| **TiO2** | 0.00 | 0.39 | 0.03 | 0.68 | 0.59 | 1.17 | 0.88 | 0.46 | 0.21 | 0.04 |
| **MnO** | 0.00 | 0.16 | 0.00 | 0.15 | 0.21 | 0.21 | 0.26 | 0.28 | 0.64 | 0.01 |
| **FeOt** | 0.21 | 6.51 | 0.17 | 8.43 | 8.39 | 8.89 | 9.72 | 8.28 | 19.35 | 0.59 |
| **Total** | 101.27 | 99.98 | 100.81 | 99.50 | 99.67 | 96.11 | 99.16 | 99.89 | 99.33 | 99.38 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.23 | 10.08.23 | 10.08.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | S32B.9.2 | S32B.9.3 | S32B.9.4 | R46.1.1 | R46.1.2 | R46.1.3 | R46.1.4 | R46.1.5 | R46.2.1 | R46.2.2 |
| | cpx | feld | cpx | cpx | cpx | cpx | cpx | cpx | feld | feld |
| **Na2O** | 0.43 | 6.55 | 0.32 | 0.32 | 0.43 | 0.42 | 0.39 | 0.47 | 3.97 | 4.05 |
| **MgO** | 13.29 | 0.02 | 12.06 | 15.25 | 13.67 | 12.98 | 13.90 | 13.28 | 0.07 | 0.08 |
| **Al2O3** | 3.93 | 25.21 | 0.77 | 1.80 | 3.08 | 4.23 | 3.11 | 4.01 | 28.38 | 28.23 |
| **SiO2** | 49.85 | 59.69 | 51.53 | 53.66 | 51.34 | 50.46 | 51.27 | 50.30 | 54.36 | 54.00 |
| **K2O** | 0.01 | 1.96 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 1.10 | 1.08 |
| **CaO** | 21.99 | 6.91 | 18.57 | 22.15 | 23.13 | 22.94 | 22.74 | 22.67 | 11.47 | 11.68 |
| **TiO2** | 0.68 | 0.04 | 0.21 | 0.29 | 0.58 | 0.79 | 0.54 | 0.75 | 0.06 | 0.05 |
| **MnO** | 0.23 | 0.00 | 0.75 | 0.19 | 0.20 | 0.32 | 0.26 | 0.26 | 0.00 | 0.00 |
| **FeOt** | 8.89 | 0.28 | 14.92 | 6.79 | 8.51 | 9.17 | 8.44 | 9.33 | 0.69 | 0.66 |
| **Total** | 99.28 | 100.65 | 99.15 | 100.44 | 100.94 | 101.30 | 100.66 | 101.08 | 100.11 | 99.83 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | R46.2.3 | R46.2.4 | R46.2.5 | R46.3.1 | R46.3.2 | R46.3.3 | R46.3.4 | R46.3.5 | R46.4.1 | R46.4.2 |
| | feld | feld | feld | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 4.20 | 4.36 | 4.40 | 0.38 | 0.42 | 0.41 | 0.41 | 0.42 | 0.54 | 0.45 |
| **MgO** | 0.08 | 0.07 | 0.07 | 13.53 | 13.61 | 13.55 | 13.81 | 13.42 | 13.29 | 13.27 |
| **Al2O3** | 27.65 | 27.50 | 27.10 | 3.74 | 3.73 | 3.79 | 3.88 | 3.69 | 3.90 | 3.68 |
| **SiO2** | 54.48 | 55.37 | 55.37 | 50.82 | 50.58 | 50.17 | 50.73 | 50.59 | 51.12 | 51.03 |
| **K2O** | 1.29 | 1.36 | 1.43 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| **CaO** | 11.28 | 10.86 | 10.56 | 23.04 | 22.10 | 22.82 | 22.06 | 21.54 | 21.21 | 22.82 |
| **TiO2** | 0.07 | 0.06 | 0.01 | 0.65 | 0.69 | 0.69 | 0.70 | 0.73 | 0.69 | 0.66 |
| **MnO** | 0.03 | 0.04 | 0.02 | 0.21 | 0.23 | 0.26 | 0.16 | 0.25 | 0.24 | 0.22 |
| **FeOt** | 0.59 | 0.68 | 0.58 | 8.68 | 8.62 | 8.44 | 8.65 | 8.72 | 9.11 | 8.96 |
| **Total** | 99.65 | 100.31 | 99.55 | 101.06 | 99.98 | 100.14 | 100.41 | 99.35 | 100.09 | 101.09 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | R46.4.3 | R46.4.4 | R46.4.5 | R46.4.6 | R46.5.1 | R46.5.2 | R46.5.3 | R46.5.4 | R46.5.5 | R46.6.1 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.52 | 0.44 | 0.44 | 0.28 | 0.42 | 0.44 | 0.47 | 0.44 | 0.44 | 0.44 |
| **MgO** | 13.49 | 13.31 | 13.79 | 16.02 | 13.12 | 13.31 | 13.36 | 13.36 | 14.32 | 13.79 |
| **Al2O3** | 3.58 | 3.82 | 3.47 | 2.27 | 4.18 | 3.92 | 3.94 | 3.81 | 2.64 | 3.42 |
| **SiO2** | 51.01 | 50.66 | 50.93 | 53.09 | 50.40 | 50.49 | 50.54 | 50.46 | 51.78 | 51.38 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 |
| **CaO** | 21.79 | 22.36 | 23.32 | 24.66 | 22.85 | 23.15 | 22.91 | 21.48 | 22.60 | 21.16 |
| **TiO2** | 0.63 | 0.74 | 0.65 | 0.33 | 0.72 | 0.68 | 0.76 | 0.70 | 0.44 | 0.59 |
| **MnO** | 0.24 | 0.27 | 0.25 | 0.07 | 0.34 | 0.23 | 0.24 | 0.24 | 0.29 | 0.30 |
| **FeOt** | 9.25 | 9.03 | 9.07 | 4.62 | 9.42 | 8.81 | 8.80 | 8.79 | 8.48 | 8.67 |
| **Total** | 100.51 | 100.62 | 101.93 | 101.35 | 101.44 | 101.04 | 101.02 | 99.30 | 101.01 | 99.76 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | R46.6.2 | R46.6.3 | R46.6.4 | R46.6.5 | R46.6.6 | R46.6.7 | S77-i.1.1.m1 | S77-i.1.1.m2 | S77-i.1.2.m1 | S77-i.1.2.m2 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.42 | 0.42 | 0.44 | 0.41 | 0.39 | 0.43 | 0.35 | 0.34 | 0.45 | 0.45 |
| **MgO** | 13.22 | 13.34 | 13.23 | 13.70 | 13.41 | 13.63 | 14.34 | 14.53 | 13.53 | 12.99 |
| **Al2O3** | 3.89 | 4.10 | 3.68 | 3.55 | 4.36 | 3.85 | 3.43 | 3.48 | 3.66 | 3.78 |
| **SiO2** | 50.96 | 50.43 | 50.70 | 50.93 | 50.20 | 50.55 | 51.12 | 50.98 | 50.13 | 50.35 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| **CaO** | 22.54 | 22.47 | 22.45 | 20.97 | 22.85 | 22.51 | 22.27 | 22.60 | 21.62 | 21.75 |
| **TiO2** | 0.67 | 0.75 | 0.67 | 0.69 | 0.67 | 0.67 | 0.56 | 0.47 | 0.66 | 0.66 |
| **MnO** | 0.22 | 0.23 | 0.26 | 0.28 | 0.21 | 0.25 | 0.16 | 0.15 | 0.27 | 0.23 |
| **FeOt** | 8.94 | 8.74 | 9.14 | 8.96 | 8.81 | 8.67 | 7.25 | 6.95 | 8.80 | 8.85 |
| **Total** | 100.86 | 100.50 | 100.57 | 99.51 | 100.91 | 100.57 | 99.48 | 99.51 | 99.12 | 99.07 |

| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-i.3.1.m | S77-i.3.1.m | S77-i.3.2.m | S77-i.3.2.m | S77-i.3.3.m | S77-i.3.3.m | S77-i.3.4.m | S77-i.3.4.m | S77-i.3.5.m | S77-i.3.5.m |
| | cpx | cpx | feld | feld | ol | ol | cpx | cpx | cpx | cpx |
| Na2O | 0.47 | 0.42 | 4.25 | 4.46 | 0.00 | 0.01 | 0.46 | 0.46 | 0.43 | 0.45 |
| MgO | 13.10 | 13.46 | 0.07 | 0.06 | 34.03 | 34.17 | 13.61 | 13.70 | 13.63 | 13.74 |
| Al2O3 | 3.91 | 3.77 | 27.64 | 27.31 | 0.00 | 0.02 | 3.29 | 3.34 | 3.29 | 3.26 |
| SiO2 | 50.13 | 49.99 | 53.59 | 54.20 | 37.07 | 37.15 | 50.91 | 50.59 | 50.44 | 50.63 |
| K2O | 0.01 | 0.01 | 1.24 | 1.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| CaO | 22.06 | 21.98 | 10.78 | 10.33 | 0.33 | 0.34 | 21.62 | 21.83 | 21.88 | 21.78 |
| TiO2 | 0.65 | 0.66 | 0.03 | 0.02 | 0.03 | 0.00 | 0.57 | 0.62 | 0.57 | 0.59 |
| MnO | 0.22 | 0.22 | 0.03 | 0.00 | 0.72 | 0.72 | 0.25 | 0.26 | 0.29 | 0.30 |
| FeOt | 8.64 | 8.50 | 0.74 | 0.80 | 27.52 | 27.43 | 8.56 | 8.68 | 8.52 | 8.67 |
| Total | 99.20 | 99.01 | 98.36 | 98.57 | 99.70 | 99.84 | 99.26 | 99.49 | 99.05 | 99.41 |
| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-i.3.5.m | S77-i.4.1.m | S77-i.4.1.m | S77-i.4.2.m | S77-i.4.3.m | S77-i.4.4.m | S77-i.4.4.m | S77-i.4.5.m | S77-i.4.5.m | S77-i.6.1.m1 |
| | cpx | feld | feld | cpx | cpx | cpx | cpx | ol | ol | cpx |
| Na2O | 0.40 | 4.16 | 4.33 | 0.44 | 0.34 | 0.50 | 0.43 | 0.00 | 0.02 | 0.42 |
| MgO | 14.18 | 0.05 | 0.06 | 14.12 | 13.84 | 13.27 | 13.43 | 34.15 | 33.83 | 14.51 |
| Al2O3 | 3.72 | 28.19 | 26.82 | 3.03 | 3.46 | 3.77 | 3.79 | 0.00 | 0.05 | 2.06 |
| SiO2 | 50.22 | 53.83 | 54.21 | 49.92 | 50.70 | 49.98 | 49.96 | 37.08 | 35.43 | 50.60 |
| K2O | 0.00 | 1.17 | 1.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| CaO | 22.12 | 10.92 | 10.10 | 21.67 | 22.35 | 21.78 | 22.01 | 0.33 | 0.34 | 21.33 |
| TiO2 | 0.56 | 0.04 | 0.04 | 0.54 | 0.51 | 0.68 | 0.68 | 0.01 | 0.00 | 0.38 |
| MnO | 0.18 | 0.00 | 0.01 | 0.26 | 0.19 | 0.24 | 0.23 | 0.69 | 0.68 | 0.33 |
| FeOt | 7.60 | 0.67 | 0.62 | 8.35 | 7.86 | 8.60 | 8.58 | 27.48 | 27.28 | 8.92 |
| Total | 99.00 | 99.04 | 97.48 | 98.33 | 99.26 | 98.82 | 99.11 | 99.75 | 97.64 | 98.55 |
| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-i.6.1.m | S77-i.6.2.m | S77-i.6.3.m | S77-i.6.3.m | S77-i.8.1.m | S77-i.8.1.m | S77-i.8.2.m | S77-i.8.2.m | S77-tot.1.m | S77-tot.1.m |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.41 | 0.32 | 0.44 | 0.45 | 0.47 | 0.38 | 0.46 | 0.38 | 0.43 | 0.43 |
| MgO | 14.23 | 14.20 | 13.59 | 13.72 | 13.96 | 13.45 | 13.63 | 14.14 | 13.49 | 13.78 |
| Al2O3 | 2.79 | 4.21 | 3.28 | 3.06 | 3.08 | 4.53 | 3.28 | 2.91 | 3.04 | 3.01 |
| SiO2 | 50.99 | 49.20 | 50.67 | 50.77 | 50.76 | 48.93 | 50.64 | 50.93 | 50.86 | 50.86 |
| K2O | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| CaO | 21.80 | 22.22 | 21.72 | 21.87 | 21.69 | 22.38 | 21.73 | 21.93 | 21.85 | 21.89 |
| TiO2 | 0.53 | 0.70 | 0.62 | 0.57 | 0.53 | 0.72 | 0.54 | 0.51 | 0.52 | 0.50 |
| MnO | 0.24 | 0.17 | 0.24 | 0.22 | 0.30 | 0.26 | 0.22 | 0.24 | 0.26 | 0.20 |
| FeOt | 8.34 | 7.42 | 8.61 | 8.57 | 8.83 | 8.64 | 8.63 | 7.99 | 8.58 | 8.45 |
| Total | 99.34 | 98.44 | 99.16 | 99.24 | 99.61 | 99.29 | 99.16 | 99.05 | 99.03 | 99.11 |
| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-tot.1.m | 77-tot.4.1.m | 77-tot.4.1.m | 77-tot.4.2.m | 77-tot.4.2.m | 77-tot.4.2.m | 77-tot.4.2.m | 77-tot.5.1.m | 77-tot.5.1.m | 77-tot.5.2.m |
| | cpx | feld | feld | cpx | cpx | feld | feld | cpx | cpx | cpx |
| Na2O | 0.39 | 3.14 | 3.21 | 0.46 | 0.44 | 4.15 | 4.22 | 0.28 | 0.27 | 0.44 |
| MgO | 13.28 | 1.74 | 1.65 | 13.49 | 13.20 | 0.06 | 0.05 | 15.50 | 15.29 | 13.39 |
| Al2O3 | 5.06 | 18.70 | 18.56 | 3.75 | 3.77 | 28.60 | 28.43 | 2.87 | 2.89 | 3.36 |
| SiO2 | 48.61 | 57.40 | 56.70 | 49.79 | 50.00 | 53.78 | 53.75 | 51.52 | 51.51 | 50.59 |
| K2O | 0.01 | 6.57 | 6.68 | 0.00 | 0.01 | 1.15 | 1.18 | 0.00 | 0.00 | 0.02 |
| CaO | 22.10 | 3.70 | 3.47 | 21.94 | 21.98 | 11.08 | 10.95 | 23.02 | 23.04 | 21.77 |
| TiO2 | 0.84 | 0.63 | 0.60 | 0.69 | 0.67 | 0.04 | 0.06 | 0.47 | 0.49 | 0.57 |
| MnO | 0.23 | 0.11 | 0.18 | 0.21 | 0.22 | 0.00 | 0.01 | 0.16 | 0.10 | 0.23 |
| FeOt | 8.76 | 5.94 | 6.26 | 8.71 | 8.69 | 0.69 | 0.64 | 5.45 | 5.81 | 8.89 |
| Total | 99.27 | 97.92 | 97.31 | 99.05 | 98.98 | 99.55 | 99.28 | 99.29 | 99.40 | 99.25 |

| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | 77-tot.8.1.m | 77-tot.8.1.m | 77-tot.8.1.m | 77-tot.8.2.m | 77-tot.8.2.m | 77-tot.8.3.m | 77-tot.8.3.m | S77-e.1.1.m | S77-e.1.1.m | S77-e.1.1.m3 |
| | feld | cpx | cpx | feld | feld | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 2.79 | 0.48 | 0.45 | 3.04 | 2.99 | 0.41 | 0.48 | 0.47 | 0.43 | 0.42 |
| **MgO** | 1.77 | 13.32 | 13.22 | 1.77 | 1.80 | 13.34 | 13.20 | 13.61 | 13.81 | 13.85 |
| **Al2O3** | 18.91 | 3.41 | 3.81 | 18.85 | 18.54 | 3.78 | 3.54 | 3.44 | 3.12 | 3.13 |
| **SiO2** | 56.86 | 50.53 | 50.05 | 56.99 | 56.76 | 49.93 | 50.42 | 49.81 | 50.58 | 50.42 |
| **K2O** | 6.07 | 0.00 | 0.00 | 6.02 | 6.19 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| **CaO** | 4.31 | 21.61 | 21.58 | 4.12 | 4.18 | 21.79 | 21.85 | 21.78 | 21.66 | 21.83 |
| **TiO2** | 0.66 | 0.64 | 0.72 | 0.66 | 0.67 | 0.63 | 0.61 | 0.65 | 0.59 | 0.58 |
| **MnO** | 0.16 | 0.27 | 0.22 | 0.15 | 0.15 | 0.25 | 0.29 | 0.30 | 0.25 | 0.27 |
| **FeOt** | 6.51 | 8.61 | 9.07 | 6.49 | 6.69 | 9.15 | 8.75 | 8.69 | 8.65 | 8.56 |
| **Total** | 98.02 | 98.87 | 99.11 | 98.09 | 97.95 | 99.28 | 99.16 | 98.76 | 99.09 | 99.06 |

| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | 77-e.10.1.m | 77-e.10.1.m | 77-e.10.2.m | 77-e.10.3.m | 77-e.10.4.m | S77-e.3.1.m | S77-e.5.1.m | S77-e.5.1.m | S77-e.5.2.m | S77-e.6.1.m1 |
| | feld | feld | feld | feld | cpx | feld | feld | feld | feld | cpx |
| **Na2O** | 4.54 | 4.02 | 4.64 | 4.66 | 0.43 | 3.45 | 3.18 | 3.27 | 4.56 | 0.42 |
| **MgO** | 0.07 | 0.07 | 0.07 | 0.06 | 13.69 | 1.78 | 1.83 | 1.97 | 0.05 | 13.11 |
| **Al2O3** | 27.04 | 28.97 | 26.89 | 26.93 | 3.42 | 18.66 | 18.44 | 18.07 | 27.09 | 3.78 |
| **SiO2** | 55.12 | 52.61 | 56.04 | 55.13 | 50.58 | 56.43 | 55.85 | 56.19 | 55.52 | 50.13 |
| **K2O** | 1.57 | 1.07 | 1.82 | 1.69 | 0.01 | 6.63 | 6.58 | 5.94 | 1.62 | 0.00 |
| **CaO** | 9.65 | 11.21 | 9.09 | 9.42 | 22.08 | 4.02 | 4.28 | 4.93 | 9.65 | 21.97 |
| **TiO2** | 0.03 | 0.02 | 0.04 | 0.04 | 0.61 | 0.65 | 0.68 | 0.69 | 0.04 | 0.66 |
| **MnO** | 0.00 | 0.05 | 0.00 | 0.00 | 0.25 | 0.17 | 0.11 | 0.16 | 0.02 | 0.26 |
| **FeOt** | 0.74 | 0.66 | 0.57 | 0.61 | 8.34 | 6.46 | 6.43 | 7.37 | 0.64 | 8.77 |
| **Total** | 98.76 | 98.67 | 99.16 | 98.56 | 99.40 | 98.24 | 97.38 | 98.59 | 99.19 | 99.10 |

| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | S77-e.6.1.m | S77-e.6.2.m | S77-e.6.2.m | S77-e.6.3.m | S77-e.6.3.m | S77-e.6.3.m | S77-e.7.1.m | S77-e.7.1.m | S77-e.7.1.m | S77-b.1.m1 |
| | cpx | cpx | cpx | feld | feld | feld | cpx | cpx | cpx | cpx |
| **Na2O** | 0.47 | 0.47 | 0.42 | 4.23 | 4.12 | 4.16 | 0.28 | 0.25 | 0.25 | 0.46 |
| **MgO** | 13.32 | 13.78 | 13.69 | 0.07 | 0.06 | 0.05 | 16.19 | 16.11 | 16.00 | 13.64 |
| **Al2O3** | 3.88 | 3.57 | 3.95 | 28.44 | 28.61 | 28.37 | 2.98 | 2.44 | 2.44 | 3.25 |
| **SiO2** | 49.94 | 50.62 | 50.09 | 53.95 | 53.50 | 53.78 | 50.91 | 52.33 | 52.27 | 50.78 |
| **K2O** | 0.00 | 0.00 | 0.00 | 1.24 | 1.12 | 1.23 | 0.00 | 0.00 | 0.00 | 0.00 |
| **CaO** | 21.83 | 22.00 | 21.98 | 10.91 | 11.04 | 10.83 | 22.38 | 23.05 | 22.93 | 21.81 |
| **TiO2** | 0.66 | 0.64 | 0.65 | 0.03 | 0.04 | 0.04 | 0.43 | 0.38 | 0.39 | 0.58 |
| **MnO** | 0.22 | 0.27 | 0.25 | 0.02 | 0.00 | 0.00 | 0.19 | 0.11 | 0.14 | 0.24 |
| **FeOt** | 9.03 | 8.50 | 8.18 | 0.70 | 0.69 | 0.67 | 5.75 | 4.66 | 5.16 | 8.51 |
| **Total** | 99.34 | 99.86 | 99.22 | 99.59 | 99.18 | 99.15 | 99.12 | 99.32 | 99.58 | 99.28 |

| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | S77-b.1.m2 | 77-b.10.1.m | S77-b.2.1.m | S77-b.2.1.m | S77-b.2.2.m | S77-b.2.2.m | S77-b.2.m1 | S77-b.2.m2 | S77-b.3.1.m | S77-b.3.1.m2 |
| | cpx | feld | cpx | cpx | feld | feld | feld | feld | feld | feld |
| **Na2O** | 0.43 | 3.02 | 0.29 | 0.27 | 4.39 | 4.18 | 4.08 | 4.17 | 4.42 | 4.82 |
| **MgO** | 13.27 | 1.67 | 15.14 | 14.95 | 0.04 | 3.93 | 0.06 | 0.07 | 0.08 | 0.07 |
| **Al2O3** | 3.75 | 18.47 | 3.10 | 3.04 | 29.43 | 16.60 | 29.05 | 28.74 | 28.00 | 27.01 |
| **SiO2** | 49.99 | 56.51 | 51.70 | 51.34 | 53.42 | 56.53 | 53.82 | 53.44 | 54.91 | 55.39 |
| **K2O** | 0.00 | 6.59 | 0.00 | 0.00 | 0.36 | 2.50 | 1.07 | 1.08 | 1.35 | 1.68 |
| **CaO** | 21.65 | 3.93 | 22.81 | 22.73 | 11.62 | 10.17 | 11.28 | 11.02 | 10.30 | 9.48 |
| **TiO2** | 0.64 | 0.67 | 0.47 | 0.47 | 0.07 | 0.65 | 0.01 | 0.03 | 0.03 | 0.04 |
| **MnO** | 0.25 | 0.17 | 0.10 | 0.13 | 0.04 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| **FeOt** | 9.00 | 6.55 | 5.69 | 5.99 | 0.77 | 4.45 | 0.73 | 0.75 | 0.70 | 0.62 |
| **Total** | 99.00 | 97.58 | 99.29 | 98.92 | 100.15 | 99.13 | 100.10 | 99.31 | 99.78 | 99.11 |

| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-b.3.1.m | S77-b.3.2.m | S77-b.3.2.m | S77-b.3.2.m | S77-b.3.m2 | S77-b.3.m3 | S77-b.4.1.m | S77-b.4.1.m | S77-b.4.1.m | S77-b.5.1.m |
| | feld | feld | feld | feld | feld | feld | cpx | cpx | cpx | feld |
| Na2O | 4.29 | 5.13 | 5.12 | 4.95 | 1.86 | 1.77 | 0.40 | 0.35 | 0.32 | 4.54 |
| MgO | 0.06 | 0.04 | 0.04 | 0.05 | 1.76 | 1.68 | 13.89 | 14.34 | 14.13 | 0.06 |
| Al2O3 | 28.30 | 27.78 | 27.90 | 27.85 | 19.13 | 19.15 | 3.43 | 2.85 | 3.79 | 27.38 |
| SiO2 | 54.06 | 55.36 | 55.44 | 55.01 | 56.39 | 56.68 | 50.90 | 51.51 | 50.79 | 55.39 |
| K2O | 1.23 | 0.62 | 0.68 | 0.86 | 5.82 | 5.70 | 0.00 | 0.00 | 0.00 | 1.57 |
| CaO | 10.68 | 9.86 | 9.74 | 9.87 | 3.50 | 3.71 | 21.89 | 22.41 | 22.41 | 9.70 |
| TiO2 | 0.04 | 0.04 | 0.05 | 0.05 | 0.64 | 0.63 | 0.60 | 0.39 | 0.63 | 0.04 |
| MnO | 0.05 | 0.00 | 0.03 | 0.01 | 0.14 | 0.18 | 0.25 | 0.20 | 0.18 | 0.00 |
| FeOt | 0.65 | 0.68 | 0.71 | 0.64 | 5.99 | 5.76 | 8.31 | 7.03 | 6.80 | 0.60 |
| Total | 99.36 | 99.52 | 99.72 | 99.31 | 95.23 | 95.26 | 99.67 | 99.08 | 99.05 | 99.29 |

| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-b.5.1.m | S77-b.5.1.m | S77-b.5.2.m | S77-b.5.2.m | S77-b.5.3.m | S77-b.5.3.m | S77-b.7.1.m | S77-b.7.1.m | S77-b.7.1.m | S77-b.8.1.m |
| | feld | feld | feld | feld | feld | feld | cpx | cpx | cpx | cpx |
| Na2O | 4.62 | 4.54 | 4.45 | 4.27 | 4.50 | 4.85 | 0.44 | 0.42 | 0.33 | 0.32 |
| MgO | 0.05 | 0.06 | 0.07 | 0.07 | 0.06 | 0.06 | 13.63 | 13.66 | 14.65 | 14.65 |
| Al2O3 | 27.30 | 27.46 | 27.65 | 28.34 | 28.77 | 27.88 | 3.80 | 3.19 | 2.51 | 3.44 |
| SiO2 | 55.25 | 55.07 | 54.57 | 54.56 | 53.09 | 54.62 | 49.61 | 50.62 | 51.45 | 50.98 |
| K2O | 1.57 | 1.46 | 1.45 | 1.29 | 0.35 | 0.59 | 0.00 | 0.01 | 0.00 | 0.00 |
| CaO | 9.72 | 9.91 | 10.01 | 10.63 | 11.56 | 10.42 | 22.06 | 21.97 | 22.50 | 22.60 |
| TiO2 | 0.02 | 0.01 | 0.02 | 0.06 | 0.04 | 0.03 | 0.67 | 0.55 | 0.41 | 0.56 |
| MnO | 0.00 | 0.02 | 0.02 | 0.01 | 0.00 | 0.00 | 0.20 | 0.29 | 0.19 | 0.16 |
| FeOt | 0.61 | 0.59 | 0.71 | 0.75 | 0.70 | 0.74 | 8.32 | 8.35 | 6.85 | 6.53 |
| Total | 99.15 | 99.11 | 98.95 | 99.98 | 99.07 | 99.19 | 98.72 | 99.05 | 98.88 | 99.23 |

| Date Analysed | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
|---|---|---|---|---|---|---|---|
| Eruptive Unit | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| Label | S77-b.8.1.m | S77-b.8.1.m | S77-b.8.2.m | S77-b.8.2.m | S77-b.8.3.m | S77-b.9.1.m | S77-b.9.1.m2 |
| | cpx | cpx | cpx | cpx | cpx | cpx | feld |
| Na2O | 0.45 | 0.43 | 0.44 | 0.44 | 0.45 | 0.35 | 3.64 |
| MgO | 13.47 | 12.76 | 13.33 | 13.30 | 13.54 | 14.50 | 1.75 |
| Al2O3 | 3.34 | 3.90 | 4.00 | 4.25 | 3.54 | 3.21 | 18.41 |
| SiO2 | 50.37 | 49.93 | 49.90 | 50.17 | 50.96 | 50.96 | 56.00 |
| K2O | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.06 | 7.24 |
| CaO | 21.54 | 21.93 | 22.06 | 21.88 | 21.66 | 21.85 | 3.48 |
| TiO2 | 0.60 | 0.68 | 0.71 | 0.66 | 0.66 | 0.52 | 0.66 |
| MnO | 0.27 | 0.27 | 0.22 | 0.24 | 0.30 | 0.23 | 0.21 |
| FeOt | 8.59 | 9.14 | 8.33 | 8.44 | 8.80 | 7.51 | 6.41 |
| Total | 98.63 | 99.03 | 98.99 | 99.42 | 99.90 | 99.20 | 97.79 |

Table G1: List of data produced through EMPA at Oxford for all the phenocrysts (including the zoned cpx phenocrysts) found in deposits from La Fossa and Vulcanello

| Date Analysed | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT2-c1-c1 | AT2-c1-m1 | AT2-c1-m2 | AT2-c1-r1 | AT2-c2-c1 | AT2-c2-m1 | AT2-c2-r1 | AT2-c3-m1 | AT2-c3-m2 | AT2-c4-m1 |
| | cpx | cpx | cpx | cpx | cpx | cpx | feld | cpx | cpx | feld |
| **Na2O** | 0.20 | 0.39 | 0.41 | 0.40 | 0.29 | 0.40 | 3.83 | 0.30 | 0.41 | 4.97 |
| **MgO** | 15.94 | 13.60 | 12.55 | 12.78 | 14.76 | 13.60 | 0.29 | 14.81 | 13.15 | 0.05 |
| **Al2O3** | 2.46 | 2.90 | 5.54 | 5.67 | 2.65 | 2.75 | 18.87 | 3.58 | 5.32 | 26.45 |
| **SiO2** | 52.71 | 51.34 | 48.22 | 49.08 | 52.18 | 51.41 | 62.90 | 51.37 | 48.99 | 56.73 |
| **K2O** | 0.01 | 0.02 | 0.04 | 0.05 | 0.00 | 0.03 | 8.89 | 0.03 | 0.05 | 1.99 |
| **CaO** | 23.23 | 21.85 | 22.09 | 22.19 | 22.98 | 21.55 | 2.08 | 22.63 | 22.01 | 8.61 |
| **TiO2** | 0.34 | 0.53 | 0.95 | 0.96 | 0.38 | 0.57 | 0.30 | 0.55 | 0.98 | 0.04 |
| **MnO** | 0.10 | 0.32 | 0.20 | 0.19 | 0.15 | 0.28 | 0.03 | 0.21 | 0.22 | 0.00 |
| **FeOt** | 4.17 | 9.02 | 9.58 | 9.42 | 6.81 | 9.04 | 1.88 | 6.97 | 8.87 | 0.53 |
| **Total** | 99.17 | 99.97 | 99.56 | 100.75 | 100.19 | 99.62 | 99.07 | 100.46 | 100.01 | 99.36 |
| **Date Analysed** | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT2-c4-m2 | AT2-c4-m3 | AT2-mc1-1 | AT2-mc2-1 | AT2-mc3-1 | AT2-mc3-2 | AT2.2-c1-m | AT2.2-c3-m | AT2.2-c3-m | AT2.2-c3-m |
| | feld | feld | feld | feld | feld | feld | feld | cpx | cpx | cpx |
| **Na2O** | 5.02 | 4.58 | 4.94 | 4.62 | 5.10 | 3.58 | 5.29 | 0.50 | 0.43 | 0.38 |
| **MgO** | 0.05 | 0.08 | 0.31 | 0.02 | 0.05 | 0.41 | 0.04 | 13.46 | 13.44 | 13.85 |
| **Al2O3** | 24.84 | 25.96 | 21.89 | 21.95 | 25.89 | 18.65 | 26.09 | 4.06 | 3.89 | 3.35 |
| **SiO2** | 57.42 | 55.63 | 60.94 | 61.76 | 56.77 | 62.85 | 57.32 | 50.25 | 50.49 | 50.84 |
| **K2O** | 2.09 | 1.42 | 4.56 | 6.32 | 1.55 | 9.28 | 2.09 | 0.00 | 0.00 | 0.00 |
| **CaO** | 8.49 | 10.11 | 5.00 | 3.90 | 9.13 | 2.09 | 7.82 | 22.15 | 22.12 | 22.53 |
| **TiO2** | 0.02 | 0.05 | 0.20 | 0.07 | 0.02 | 0.34 | 0.06 | 0.71 | 0.66 | 0.54 |
| **MnO** | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.25 | 0.21 | 0.20 |
| **FeOt** | 0.56 | 0.62 | 1.52 | 0.67 | 0.73 | 2.10 | 0.62 | 8.67 | 8.42 | 7.92 |
| **Total** | 98.49 | 98.47 | 99.36 | 99.31 | 99.24 | 99.31 | 99.34 | 100.06 | 99.65 | 99.61 |
| **Date Analysed** | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT2.2-c4-m | AT2.2-c5-m | AT2.2-c6-m | AT2.2-c7-m | AT2.2-c9-m | AT2.2-c9-m | AT2.2-mc1- | AT2.2-mc2- | AT2.3-c1-m | AT2.3-c1-m1 |
| | feld | feld | cpx | ol | feld | feld | feld | feld | feld | feld |
| **Na2O** | 5.11 | 4.84 | 0.47 | 0.00 | 5.04 | 5.00 | 3.59 | 5.07 | 4.05 | 4.06 |
| **MgO** | 0.04 | 0.04 | 13.99 | 31.38 | 0.04 | 0.05 | 0.08 | 0.15 | 0.07 | 0.06 |
| **Al2O3** | 25.98 | 26.90 | 2.63 | 0.00 | 26.37 | 25.50 | 18.62 | 21.27 | 28.42 | 28.04 |
| **SiO2** | 57.38 | 56.41 | 51.17 | 37.51 | 57.29 | 57.46 | 64.02 | 62.27 | 53.81 | 53.52 |
| **K2O** | 1.89 | 1.50 | 0.01 | 0.03 | 1.95 | 1.93 | 9.74 | 5.78 | 1.00 | 0.96 |
| **CaO** | 8.72 | 9.40 | 21.48 | 0.31 | 8.45 | 8.47 | 1.51 | 3.78 | 11.59 | 11.68 |
| **TiO2** | 0.04 | 0.05 | 0.56 | 0.03 | 0.02 | 0.05 | 0.15 | 0.18 | 0.04 | 0.06 |
| **MnO** | 0.01 | 0.04 | 0.37 | 0.78 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.02 |
| **FeOt** | 0.66 | 0.67 | 8.94 | 31.16 | 0.66 | 0.68 | 0.83 | 1.27 | 0.66 | 0.57 |
| **Total** | 99.82 | 99.87 | 99.61 | 101.19 | 99.82 | 99.17 | 98.54 | 99.76 | 99.63 | 98.96 |
| **Date Analysed** | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT2.3-c1-r2 | AT2.3-c1-m | AT2.4-c1-m | AT2.4-c1-m | AT2.4-mc1- | AT2.4-mc1- | AT2.4-mc1- | AT2.5-c1-m | AT2.5-c1-r1 | AT2.5-c2-r1 |
| | feld | feld | feld | feld | feld | feld | cpx | cpx | cpx | cpx |
| **Na2O** | 3.31 | 4.83 | 4.47 | 4.69 | 4.45 | 3.63 | 0.39 | 0.45 | 0.45 | 0.40 |
| **MgO** | 1.00 | 0.05 | 0.06 | 0.05 | 0.03 | 0.01 | 13.24 | 13.74 | 13.44 | 13.73 |
| **Al2O3** | 17.14 | 27.52 | 27.97 | 26.89 | 23.02 | 20.91 | 5.00 | 3.04 | 3.33 | 2.43 |
| **SiO2** | 62.37 | 56.09 | 55.11 | 56.47 | 60.98 | 61.93 | 50.09 | 51.56 | 50.95 | 51.44 |
| **K2O** | 6.37 | 1.49 | 1.29 | 1.51 | 6.72 | 9.50 | 0.11 | 0.02 | 0.02 | 0.02 |
| **CaO** | 2.43 | 9.49 | 10.40 | 9.67 | 3.38 | 1.45 | 21.81 | 21.53 | 21.52 | 21.40 |
| **TiO2** | 0.57 | 0.00 | 0.05 | 0.02 | 0.10 | 0.18 | 0.86 | 0.55 | 0.70 | 0.51 |
| **MnO** | 0.05 | 0.07 | 0.02 | 0.00 | 0.03 | 0.00 | 0.14 | 0.31 | 0.31 | 0.31 |
| **FeOt** | 5.40 | 0.64 | 0.58 | 0.50 | 0.58 | 0.62 | 8.61 | 9.11 | 9.31 | 9.71 |
| **Total** | 98.65 | 100.18 | 99.94 | 99.81 | 99.29 | 98.21 | 100.25 | 100.32 | 100.03 | 99.95 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT2.5-c2-r2 | AT2.5-c2-m | AT2.5-c2-m | AT2.5-c3-m | AT2.5-c4-m | AT2.5-mc1- | AT2.6-c1-m | AT2.6-c1-m | AT2.6-c1-m | AT2.6-c1-m4 |
| | cpx | cpx | cpx | feld | feld | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.39 | 0.47 | 0.43 | 4.15 | 3.33 | 0.43 | 0.39 | 0.46 | 0.43 | 0.31 |
| **MgO** | 13.68 | 13.78 | 13.88 | 0.02 | 1.07 | 13.24 | 13.73 | 13.68 | 13.78 | 13.88 |
| **Al2O3** | 2.53 | 2.95 | 2.69 | 20.48 | 18.12 | 2.82 | 3.28 | 3.93 | 2.91 | 4.05 |
| **SiO2** | 51.59 | 51.02 | 51.24 | 62.90 | 61.39 | 50.58 | 51.50 | 50.70 | 52.10 | 51.33 |
| **K2O** | 0.05 | 0.01 | 0.00 | 8.15 | 6.38 | 0.10 | 0.00 | 0.02 | 0.00 | 0.02 |
| **CaO** | 21.57 | 21.58 | 21.54 | 2.70 | 2.64 | 20.80 | 22.13 | 22.18 | 22.05 | 22.46 |
| **TiO2** | 0.50 | 0.61 | 0.54 | 0.28 | 0.59 | 0.59 | 0.64 | 0.74 | 0.45 | 0.52 |
| **MnO** | 0.29 | 0.32 | 0.31 | 0.02 | 0.18 | 0.43 | 0.21 | 0.27 | 0.20 | 0.12 |
| **FeOt** | 9.30 | 9.39 | 8.81 | 1.36 | 5.63 | 10.17 | 8.59 | 8.63 | 7.60 | 7.86 |
| **Total** | 99.90 | 100.11 | 99.45 | 100.06 | 99.33 | 99.16 | 100.49 | 100.62 | 99.50 | 100.56 |
| **Date Analysed** | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT2.6-c2-m | AT2.6-c2-m | AT2.6-c3-m | AT2.7-c1 | GAT2.1.c1 | GAT2.1.c2 | GAT2.1.c3 | GAT2.1.cry1 | GAT2.1.cry2 | GAT2.1.cry3 |
| | feld | feld | cpx | feld | cpx | cpx | cpx | feld | feld | cpx |
| **Na2O** | 2.94 | 3.27 | 0.45 | 4.55 | 0.23 | 0.23 | 0.20 | 4.79 | 4.87 | 0.20 |
| **MgO** | 0.76 | 0.84 | 12.84 | 0.04 | 16.58 | 16.83 | 16.30 | 0.05 | 0.04 | 16.40 |
| **Al2O3** | 18.42 | 18.74 | 4.02 | 26.08 | 1.64 | 1.39 | 1.69 | 25.34 | 26.21 | 1.85 |
| **SiO2** | 60.62 | 60.18 | 52.51 | 55.25 | 53.30 | 53.73 | 53.73 | 56.03 | 57.12 | 53.49 |
| **K2O** | 6.66 | 6.82 | 0.03 | 1.37 | 0.00 | 0.01 | 0.00 | 1.67 | 1.68 | 0.00 |
| **CaO** | 2.24 | 2.24 | 21.61 | 10.32 | 22.44 | 21.51 | 23.76 | 8.81 | 8.84 | 22.78 |
| **TiO2** | 0.42 | 0.47 | 0.70 | 0.05 | 0.34 | 0.32 | 0.30 | 0.03 | 0.07 | 0.33 |
| **MnO** | 0.12 | 0.15 | 0.21 | 0.00 | 0.15 | 0.12 | 0.15 | 0.00 | 0.03 | 0.20 |
| **FeOt** | 4.77 | 5.29 | 8.57 | 0.54 | 5.71 | 5.35 | 5.45 | 0.64 | 0.64 | 6.04 |
| **Total** | 96.95 | 98.00 | 100.93 | 98.20 | 100.38 | 99.48 | 101.58 | 97.36 | 99.50 | 101.29 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | GAT2.1.cry4 | GAT2.1.cry5 | GAT2.1.cry6 | GAT2.1.cry7 | GAT2.1.m1 | GAT2.1.m3 | GAT2.1.r1 | GAT2.1.r2 | GAT2.1.r3 | GAT2.1.r4 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.30 | 0.27 | 0.29 | 0.20 | 0.33 | 0.27 | 0.38 | 0.40 | 0.38 | 0.45 |
| **MgO** | 16.51 | 16.63 | 15.64 | 16.15 | 13.71 | 15.42 | 13.92 | 13.83 | 13.86 | 13.69 |
| **Al2O3** | 2.28 | 2.22 | 2.82 | 2.28 | 4.11 | 2.20 | 2.24 | 1.73 | 2.25 | 2.91 |
| **SiO2** | 49.21 | 52.62 | 50.86 | 53.42 | 50.55 | 53.13 | 52.01 | 52.32 | 51.83 | 51.73 |
| **K2O** | 0.02 | 0.00 | 0.03 | 0.00 | 0.01 | 0.01 | 0.05 | 0.05 | 0.06 | 0.00 |
| **CaO** | 21.01 | 23.70 | 23.21 | 24.44 | 22.47 | 21.71 | 22.39 | 21.02 | 22.02 | 19.92 |
| **TiO2** | 0.38 | 0.31 | 0.42 | 0.32 | 0.62 | 0.34 | 0.44 | 0.37 | 0.43 | 0.56 |
| **MnO** | 0.16 | 0.11 | 0.20 | 0.07 | 0.24 | 0.16 | 0.37 | 0.36 | 0.39 | 0.30 |
| **FeOt** | 5.62 | 4.21 | 5.93 | 4.50 | 8.81 | 6.40 | 9.61 | 9.66 | 9.51 | 9.00 |
| **Total** | 95.50 | 100.06 | 99.40 | 101.39 | 100.85 | 99.64 | 101.42 | 99.74 | 100.72 | 98.55 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | GAT2.11.cry | GAT2.11.cry | GAT2.11.cry | GAT2.12.cry | GAT2.12.cry | GAT2.12.cry | GAT2.12.cry | GAT2.12.cry | GAT2.12.cry | GAT2.12.cry |
| | cpx | cpx | cpx | cpx | cpx | cpx | ol | ol | feld | feld |
| **Na2O** | 0.17 | 0.22 | 0.21 | 0.43 | 0.38 | 0.43 | 0.02 | 0.02 | 4.59 | 4.50 |
| **MgO** | 16.82 | 16.39 | 16.27 | 14.20 | 14.41 | 13.62 | 31.63 | 32.23 | 0.04 | 0.07 |
| **Al2O3** | 1.37 | 2.02 | 1.58 | 2.07 | 1.96 | 2.86 | 0.01 | 0.00 | 27.24 | 27.15 |
| **SiO2** | 54.17 | 52.71 | 52.79 | 52.47 | 52.72 | 51.20 | 37.16 | 36.75 | 55.83 | 55.00 |
| **K2O** | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 1.31 | 1.04 |
| **CaO** | 22.54 | 24.75 | 23.10 | 21.81 | 21.68 | 21.89 | 0.33 | 0.31 | 10.60 | 11.06 |
| **TiO2** | 0.25 | 0.33 | 0.28 | 0.37 | 0.36 | 0.53 | 0.01 | 0.03 | 0.03 | 0.03 |
| **MnO** | 0.07 | 0.09 | 0.16 | 0.47 | 0.36 | 0.33 | 0.88 | 0.76 | 0.02 | 0.03 |
| **FeOt** | 4.90 | 4.52 | 6.10 | 9.40 | 8.94 | 9.56 | 31.00 | 31.16 | 0.70 | 0.74 |
| **Total** | 100.31 | 101.03 | 100.49 | 101.22 | 100.83 | 100.43 | 101.04 | 101.28 | 100.35 | 99.62 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | GAT2.13.cry | GAT2.13.cry | GAT2.13.cry | GAT2.13.cry | GAT2.13.cry | GAT2.14.cry | GAT2.14.cry | GAT2.14.cry | GAT2.2.cry1 | GAT2.2.cry2 |
| | cpx | feld | cpx | cpx | cpx | feld | cpx | cpx | cpx | cpx |
| **Na2O** | 0.40 | 4.04 | 0.26 | 0.24 | 0.46 | 4.86 | 0.37 | 0.48 | 0.46 | 0.23 |
| **MgO** | 13.98 | 1.77 | 16.11 | 15.52 | 13.46 | 0.06 | 13.67 | 14.42 | 13.82 | 16.23 |
| **Al2O3** | 2.63 | 19.79 | 1.78 | 2.67 | 3.19 | 26.17 | 3.11 | 1.55 | 2.57 | 2.41 |
| **SiO2** | 51.82 | 56.04 | 53.53 | 52.28 | 50.85 | 56.44 | 50.95 | 52.39 | 50.82 | 52.91 |
| **K2O** | 0.01 | 7.01 | 0.00 | 0.01 | 0.03 | 1.41 | 0.00 | 0.00 | 0.00 | 0.01 |
| **CaO** | 21.70 | 3.15 | 23.38 | 23.69 | 22.13 | 9.88 | 20.93 | 20.56 | 22.06 | 24.44 |
| **TiO2** | 0.49 | 0.40 | 0.25 | 0.37 | 0.67 | 0.06 | 0.73 | 0.55 | 0.52 | 0.36 |
| **MnO** | 0.39 | 0.13 | 0.14 | 0.16 | 0.32 | 0.01 | 0.35 | 0.28 | 0.34 | 0.11 |
| **FeOt** | 9.09 | 5.50 | 5.79 | 6.38 | 9.52 | 0.55 | 10.35 | 10.38 | 9.17 | 4.62 |
| **Total** | 100.51 | 97.84 | 101.25 | 101.31 | 100.63 | 99.45 | 100.46 | 100.61 | 99.76 | 101.32 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | GAT2.2.cry3 | GAT2.2.cry4 | GAT2.2.cry5 | GAT2.2.cry6 | GAT2.2.cry7 | GAT2.2.cry8 | GAT2.3.a1 | GAT2.3.b1 | GAT2.3.c1 | GAT2.3.e1 |
| | cpx | cpx | cpx | cpx | feld | feld | ol | ol | ol | ol |
| **Na2O** | 0.43 | 0.26 | 0.31 | 0.24 | 4.83 | 4.72 | 0.01 | 0.00 | 0.00 | 0.00 |
| **MgO** | 14.11 | 16.49 | 15.38 | 16.24 | 0.05 | 0.06 | 30.64 | 31.00 | 31.52 | 31.29 |
| **Al2O3** | 2.64 | 2.17 | 2.86 | 2.45 | 25.74 | 25.69 | 0.00 | 0.02 | 0.01 | 0.05 |
| **SiO2** | 50.86 | 53.27 | 51.79 | 52.48 | 55.63 | 55.09 | 37.16 | 37.03 | 37.00 | 36.80 |
| **K2O** | 0.00 | 0.01 | 0.03 | 0.01 | 1.46 | 1.36 | 0.00 | 0.00 | 0.00 | 0.00 |
| **CaO** | 22.64 | 24.17 | 24.01 | 24.26 | 9.84 | 9.99 | 0.30 | 0.30 | 0.32 | 0.28 |
| **TiO2** | 0.52 | 0.31 | 0.48 | 0.41 | 0.04 | 0.03 | 0.00 | 0.01 | 0.02 | 0.00 |
| **MnO** | 0.33 | 0.17 | 0.14 | 0.09 | 0.01 | 0.00 | 0.73 | 0.84 | 0.86 | 0.87 |
| **FeOt** | 8.91 | 4.39 | 6.33 | 4.86 | 0.61 | 0.65 | 31.62 | 31.41 | 31.32 | 31.97 |
| **Total** | 100.44 | 101.23 | 101.32 | 101.05 | 98.22 | 97.59 | 100.47 | 100.61 | 101.05 | 101.26 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | GAT2.3.f1 | GAT2.3.g1 | GAT2.4.cry1 | GAT2.4.cry2 | GAT2.4.cry3 | GAT2.4.cry4 | GAT2.4.cry5 | GAT2.4.cry6 | GAT2.4.cry7 | GAT2.5.cry1 |
| | ol | ol | ol | ol | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.02 | 0.02 | 0.00 | 0.00 | 0.43 | 0.31 | 0.42 | 0.29 | 0.26 | 0.17 |
| **MgO** | 31.09 | 31.02 | 32.14 | 32.38 | 13.66 | 14.66 | 14.16 | 14.92 | 15.70 | 17.20 |
| **Al2O3** | 0.03 | 0.04 | 0.02 | 0.03 | 3.35 | 2.85 | 2.30 | 2.85 | 2.79 | 1.46 |
| **SiO2** | 36.85 | 36.97 | 36.74 | 36.18 | 50.59 | 52.04 | 52.28 | 51.69 | 52.04 | 53.67 |
| **K2O** | 0.01 | 0.02 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 |
| **CaO** | 0.30 | 0.29 | 0.35 | 0.32 | 22.36 | 22.57 | 21.30 | 22.42 | 23.62 | 22.79 |
| **TiO2** | 0.00 | 0.01 | 0.03 | 0.01 | 0.66 | 0.44 | 0.38 | 0.43 | 0.37 | 0.26 |
| **MnO** | 0.77 | 0.86 | 0.69 | 0.77 | 0.28 | 0.25 | 0.37 | 0.17 | 0.14 | 0.07 |
| **FeOt** | 31.83 | 31.99 | 30.35 | 30.40 | 9.03 | 7.00 | 9.08 | 6.69 | 5.37 | 4.06 |
| **Total** | 100.90 | 101.23 | 100.32 | 100.09 | 100.36 | 100.12 | 100.29 | 99.46 | 100.31 | 99.70 |

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|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | GAT2.5.cry2 | GAT2.5.cry3 | GAT2.5.cry4 | GAT2.5.cry5 | GAT2.5.cry6 | GAT2.6.cry2 | GAT2.6.cry3 | GAT2.6.cry4 | GAT2.6.cry5 | GAT2.7.cry2 |
| | cpx | cpx | feld | cpx | ol | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.37 | 0.31 | 4.88 | 0.41 | 0.02 | 0.45 | 0.42 | 0.40 | 0.38 | 0.44 |
| **MgO** | 13.97 | 14.73 | 0.05 | 13.80 | 30.07 | 14.10 | 13.92 | 14.49 | 14.21 | 13.80 |
| **Al2O3** | 4.06 | 3.59 | 25.42 | 2.19 | 0.00 | 2.43 | 2.64 | 1.75 | 2.14 | 2.67 |
| **SiO2** | 49.78 | 50.79 | 55.69 | 50.92 | 36.37 | 51.70 | 51.49 | 52.51 | 52.10 | 51.95 |
| **K2O** | 0.04 | 0.02 | 1.68 | 0.09 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| **CaO** | 22.78 | 22.95 | 9.70 | 21.78 | 0.29 | 22.04 | 22.56 | 22.20 | 21.23 | 22.09 |
| **TiO2** | 0.61 | 0.64 | 0.04 | 0.49 | 0.06 | 0.45 | 0.49 | 0.33 | 0.43 | 0.49 |
| **MnO** | 0.17 | 0.10 | 0.02 | 0.38 | 0.87 | 0.39 | 0.36 | 0.43 | 0.31 | 0.37 |
| **FeOt** | 8.69 | 6.83 | 0.61 | 9.72 | 31.67 | 9.10 | 9.43 | 8.87 | 9.05 | 9.25 |
| **Total** | 100.47 | 99.97 | 98.09 | 99.79 | 99.37 | 100.66 | 101.31 | 100.99 | 99.85 | 101.07 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | GAT2.7.cry3 | GAT2.7.cry4 | GAT2.8.cry1 | GAT2.8.cry1( | GAT2.8.cry2 | GAT2.8.cry3 | GAT2.8.cry4 | GAT2.8.cry5 | GAT2.8.cry6 | GAT2.8.cry7 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | ol | cpx |
| **Na2O** | 0.44 | 0.44 | 0.41 | 0.21 | 0.37 | 0.27 | 0.20 | 0.22 | 0.00 | 0.22 |
| **MgO** | 13.64 | 13.79 | 13.99 | 16.07 | 14.60 | 15.02 | 16.52 | 16.38 | 30.99 | 15.59 |
| **Al2O3** | 3.01 | 2.66 | 2.98 | 2.33 | 3.36 | 3.54 | 1.85 | 2.17 | 0.04 | 2.02 |
| **SiO2** | 51.29 | 51.58 | 51.25 | 53.08 | 50.87 | 51.12 | 52.35 | 52.87 | 36.53 | 52.26 |
| **K2O** | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.02 |
| **CaO** | 22.85 | 22.27 | 21.68 | 24.14 | 23.26 | 23.35 | 23.17 | 22.45 | 0.29 | 21.61 |
| **TiO2** | 0.58 | 0.51 | 0.50 | 0.39 | 0.50 | 0.61 | 0.22 | 0.29 | 0.01 | 0.37 |
| **MnO** | 0.26 | 0.30 | 0.32 | 0.06 | 0.21 | 0.14 | 0.13 | 0.16 | 0.83 | 0.20 |
| **FeOt** | 9.40 | 9.41 | 9.31 | 4.84 | 7.87 | 6.67 | 4.85 | 4.66 | 31.87 | 7.23 |
| **Total** | 101.49 | 100.97 | 100.46 | 101.12 | 101.05 | 100.71 | 99.30 | 99.20 | 100.57 | 99.52 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | GAT2.8.cry8 | GAT2.8.cry9 | GAT2.9.c1 | GAT2.9.c2 | GAT2.9.cry1 | GAT2.9.r1 | GAT2.9.r2 | AT12.1.1 | AT12.1.2 | AT12.1.3 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.44 | 0.42 | 0.26 | 0.27 | 0.27 | 0.42 | 0.41 | 0.53 | 0.62 | 0.67 |
| **MgO** | 13.65 | 14.03 | 16.32 | 16.17 | 15.94 | 13.92 | 13.92 | 13.84 | 11.90 | 11.22 |
| **Al2O3** | 2.90 | 2.64 | 2.17 | 2.24 | 2.53 | 2.62 | 2.07 | 3.65 | 2.36 | 0.38 |
| **SiO2** | 51.70 | 51.93 | 51.66 | 51.52 | 52.29 | 50.12 | 51.00 | 50.27 | 51.26 | 52.28 |
| **K2O** | 0.02 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.03 | 0.01 | 0.03 | 0.04 |
| **CaO** | 20.48 | 22.17 | 23.41 | 24.47 | 23.61 | 22.28 | 22.03 | 22.06 | 22.30 | 20.20 |
| **TiO2** | 0.54 | 0.53 | 0.37 | 0.33 | 0.41 | 0.54 | 0.42 | 0.63 | 0.31 | 0.26 |
| **MnO** | 0.21 | 0.33 | 0.11 | 0.12 | 0.10 | 0.40 | 0.32 | 0.29 | 0.59 | 0.65 |
| **FeOt** | 9.29 | 9.10 | 5.03 | 5.35 | 4.55 | 9.19 | 9.51 | 8.74 | 10.66 | 14.31 |
| **Total** | 99.22 | 101.17 | 99.33 | 100.47 | 99.70 | 99.50 | 99.71 | 100.01 | 100.03 | 100.00 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT12.1.4 | AT12.1.5 | AT12.1.6 | AT12.2.1 | AT12.2.2 | AT12.2.3 | AT12.2.4 | AT12.3.1 | AT12.3.3 | AT12.3.4 |
| | cpx | feld | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.53 | 3.70 | 0.46 | 0.51 | 0.46 | 0.42 | 0.45 | 0.45 | 0.43 | 0.45 |
| **MgO** | 11.78 | 0.02 | 13.70 | 13.44 | 14.12 | 14.07 | 13.90 | 13.46 | 14.28 | 14.06 |
| **Al2O3** | 0.45 | 20.80 | 4.23 | 3.98 | 2.81 | 3.39 | 3.46 | 4.09 | 2.07 | 3.18 |
| **SiO2** | 52.36 | 66.28 | 49.92 | 50.04 | 51.52 | 50.92 | 50.37 | 49.87 | 51.74 | 50.91 |
| **K2O** | 0.01 | 7.71 | 0.01 | 0.00 | 0.00 | 0.05 | 0.01 | 0.00 | 0.01 | 0.00 |
| **CaO** | 20.94 | 1.35 | 22.09 | 22.13 | 21.76 | 22.33 | 21.91 | 22.05 | 21.52 | 21.86 |
| **TiO2** | 0.23 | 0.15 | 0.71 | 0.69 | 0.51 | 0.56 | 0.61 | 0.63 | 0.34 | 0.57 |
| **MnO** | 0.55 | 0.00 | 0.16 | 0.24 | 0.30 | 0.22 | 0.27 | 0.25 | 0.39 | 0.25 |
| **FeOt** | 13.01 | 0.74 | 8.29 | 8.80 | 8.81 | 8.23 | 8.33 | 8.55 | 9.01 | 8.49 |
| **Total** | 99.87 | 100.74 | 99.58 | 99.82 | 100.28 | 100.20 | 99.31 | 99.34 | 99.78 | 99.76 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT12.4.5 | AT12.4.7 | AT12.4.8 | AT12.5.1 | AT12.5.2 | AT12.5.3 | AT12.5.4 | AT12.5.5 | AT12.5.6 | AT12.7.rim1 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.37 | 0.29 | 0.30 | 0.40 | 0.49 | 0.46 | 0.42 | 0.35 | 0.35 | 0.37 |
| **MgO** | 14.06 | 16.49 | 16.00 | 13.35 | 13.36 | 13.90 | 14.71 | 14.64 | 14.83 | 14.49 |
| **Al2O3** | 3.92 | 1.73 | 3.32 | 4.42 | 4.82 | 3.91 | 2.34 | 4.31 | 3.79 | 2.07 |
| **SiO2** | 50.11 | 53.31 | 51.78 | 49.24 | 49.36 | 50.29 | 51.84 | 50.08 | 50.86 | 51.93 |
| **K2O** | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 | 0.02 | 0.05 | 0.01 |
| **CaO** | 22.36 | 22.52 | 23.19 | 22.38 | 22.16 | 22.60 | 22.22 | 22.50 | 22.61 | 21.52 |
| **TiO2** | 0.67 | 0.31 | 0.56 | 0.73 | 0.76 | 0.68 | 0.39 | 0.84 | 0.66 | 0.40 |
| **MnO** | 0.22 | 0.14 | 0.11 | 0.25 | 0.20 | 0.24 | 0.24 | 0.15 | 0.14 | 0.36 |
| **FeOt** | 8.39 | 5.61 | 4.99 | 8.54 | 8.75 | 8.12 | 7.74 | 6.80 | 6.97 | 8.75 |
| **Total** | 100.09 | 100.40 | 100.27 | 99.31 | 99.90 | 100.20 | 99.90 | 99.70 | 100.26 | 99.89 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT12.7.rim2 | AT12.7.core1 | AT12.7.core2 | AT12.7.core3 | AT12.7.rim3 | AT12.7.rim4 | AT12.7.3 | AT12.7.4 | AT12.7.5 | AT12.11.1 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.15 | 0.42 | 0.47 | 0.48 | 0.34 | 0.44 | 0.40 | 0.48 | 0.51 | 0.34 |
| **MgO** | 17.35 | 14.00 | 13.86 | 14.08 | 15.60 | 14.06 | 14.31 | 13.94 | 13.94 | 15.82 |
| **Al2O3** | 1.21 | 3.55 | 3.39 | 3.72 | 2.92 | 2.70 | 3.15 | 3.22 | 3.16 | 3.06 |
| **SiO2** | 54.16 | 50.75 | 50.90 | 50.50 | 51.45 | 51.12 | 51.06 | 50.44 | 49.61 | 51.73 |
| **K2O** | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.02 | 0.00 | 0.00 |
| **CaO** | 23.12 | 21.96 | 21.99 | 21.96 | 22.49 | 21.16 | 22.33 | 21.93 | 21.85 | 22.47 |
| **TiO2** | 0.23 | 0.54 | 0.56 | 0.58 | 0.46 | 0.47 | 0.56 | 0.56 | 0.58 | 0.47 |
| **MnO** | 0.12 | 0.25 | 0.27 | 0.28 | 0.17 | 0.37 | 0.24 | 0.32 | 0.27 | 0.17 |
| **FeOt** | 4.24 | 8.69 | 8.66 | 8.34 | 6.10 | 9.35 | 8.26 | 8.63 | 8.84 | 5.79 |
| **Total** | 100.59 | 100.17 | 100.11 | 99.94 | 99.53 | 99.73 | 100.31 | 99.54 | 98.76 | 99.84 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT12.11.2 | AT12.11.3 | AT12.11.4 | AT12.14.1 | AT12.14.2 | AT12.15.1 | AT12.15.2 | AT12.15.3 | AT12.15.4 | AT12.15.5 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.41 | 0.41 | 0.42 | 0.38 | 0.28 | 0.51 | 0.39 | 0.47 | 0.49 | 0.27 |
| **MgO** | 14.41 | 14.03 | 14.75 | 14.14 | 16.34 | 13.89 | 14.00 | 14.44 | 13.56 | 15.85 |
| **Al2O3** | 2.53 | 2.50 | 1.71 | 3.16 | 2.58 | 3.46 | 3.14 | 3.07 | 3.89 | 2.58 |
| **SiO2** | 51.53 | 51.10 | 51.89 | 51.06 | 52.65 | 50.62 | 51.15 | 50.95 | 50.08 | 52.36 |
| **K2O** | 0.02 | 0.04 | 0.01 | 0.01 | 0.01 | 0.00 | 0.29 | 0.01 | 0.02 | 0.01 |
| **CaO** | 21.66 | 21.49 | 20.89 | 21.86 | 22.93 | 21.95 | 22.17 | 21.85 | 22.11 | 23.14 |
| **TiO2** | 0.44 | 0.44 | 0.31 | 0.55 | 0.35 | 0.63 | 0.53 | 0.56 | 0.69 | 0.34 |
| **MnO** | 0.30 | 0.33 | 0.43 | 0.27 | 0.12 | 0.22 | 0.26 | 0.23 | 0.21 | 0.13 |
| **FeOt** | 8.84 | 9.08 | 9.58 | 8.31 | 5.14 | 8.83 | 8.67 | 8.42 | 8.81 | 5.60 |
| **Total** | 100.15 | 99.43 | 99.99 | 99.73 | 100.40 | 100.10 | 100.59 | 100.01 | 99.86 | 100.28 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | AT12.15.6 | AT12.15.7 | AT12.15.8 | AT12.19.1 | AT12.19.2 | AT12.19.3 | AT12.18.1 | AT12.18.2 | AT12.18.3 | AT12.18.5 |
| | feld | feld | feld | feld | cpx | feld | cpx | cpx | cpx | feld |
| **Na2O** | 5.94 | 4.93 | 4.84 | 4.91 | 0.37 | 4.92 | 0.42 | 0.50 | 0.49 | 3.89 |
| **MgO** | 0.03 | 0.08 | 0.08 | 0.08 | 14.74 | 0.05 | 13.64 | 14.00 | 13.65 | 0.87 |
| **Al2O3** | 24.00 | 28.20 | 28.30 | 27.55 | 3.80 | 27.46 | 3.74 | 3.08 | 3.99 | 19.69 |
| **SiO2** | 59.40 | 54.72 | 54.85 | 50.99 | 50.63 | 55.53 | 50.47 | 51.34 | 50.01 | 61.88 |
| **K2O** | 3.37 | 0.90 | 1.17 | 0.88 | 0.00 | 1.48 | 0.00 | 0.00 | 0.00 | 5.81 |
| **CaO** | 5.99 | 10.37 | 10.46 | 10.98 | 22.60 | 9.81 | 22.17 | 22.05 | 22.11 | 2.75 |
| **TiO2** | 0.09 | 0.06 | 0.03 | 0.03 | 0.62 | 0.05 | 0.66 | 0.55 | 0.74 | 0.59 |
| **MnO** | 0.01 | 0.00 | 0.00 | 0.00 | 0.18 | 0.02 | 0.19 | 0.31 | 0.22 | 0.09 |
| **FeOt** | 0.56 | 0.65 | 0.73 | 0.73 | 7.04 | 0.65 | 8.62 | 8.75 | 8.89 | 3.07 |
| **Total** | 99.39 | 99.91 | 100.46 | 96.15 | 99.98 | 99.98 | 99.90 | 100.59 | 100.10 | 98.62 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| **Label** | VLS3.1.1 | VLS3.1.2 | VLS3.1.3 | VLS3.1.4 | VLS3.1.5 | VLS3.10.1 | VLS3.10.2 | VLS3.10.3 | VLS3.10.4 | VLS3.13.1 |
| | cpx | cpx | cpx | feld | cpx | cpx | cpx | cpx | cpx | feld |
| **Na2O** | 0.57 | 0.49 | 0.46 | 2.49 | 0.24 | 0.45 | 0.42 | 0.28 | 0.37 | 2.70 |
| **MgO** | 13.51 | 13.29 | 13.85 | 1.88 | 16.43 | 13.85 | 13.61 | 14.80 | 14.36 | 1.85 |
| **Al2O3** | 3.73 | 3.83 | 3.40 | 18.39 | 3.11 | 3.37 | 3.53 | 3.85 | 3.50 | 18.88 |
| **SiO2** | 50.64 | 49.65 | 50.12 | 57.25 | 51.55 | 50.56 | 49.95 | 50.11 | 50.47 | 56.98 |
| **K2O** | 0.00 | 0.00 | 0.01 | 5.28 | 0.00 | 0.02 | 0.01 | 0.00 | 0.01 | 5.63 |
| **CaO** | 21.87 | 21.89 | 21.69 | 4.39 | 23.21 | 21.83 | 21.75 | 23.02 | 22.55 | 4.53 |
| **TiO2** | 0.67 | 0.69 | 0.57 | 0.74 | 0.45 | 0.59 | 0.58 | 0.72 | 0.56 | 0.68 |
| **MnO** | 0.32 | 0.28 | 0.27 | 0.17 | 0.14 | 0.24 | 0.24 | 0.12 | 0.18 | 0.15 |
| **FeOt** | 8.94 | 8.82 | 8.21 | 7.33 | 4.83 | 8.53 | 8.26 | 6.33 | 7.26 | 7.46 |
| **Total** | 100.24 | 98.95 | 98.57 | 97.91 | 99.95 | 99.46 | 98.36 | 99.24 | 99.26 | 98.87 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| Label | VLS3.13.2 | VLS3.13.3 | VLS3.13.4 | VLS3.13.5 | VLS3.13.6 | VLS3.13.7 | VLS3.14.1 | VLS3.14.2 | VLS3.14.3 | VLS3.14.4 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.37 | 0.36 | 0.46 | 0.45 | 0.47 | 0.30 | 0.45 | 0.25 | 0.43 | 0.48 |
| MgO | 14.33 | 14.70 | 13.96 | 14.10 | 13.41 | 15.03 | 14.24 | 15.95 | 13.43 | 13.22 |
| Al2O3 | 4.13 | 2.94 | 3.17 | 3.69 | 4.09 | 3.86 | 2.97 | 2.53 | 3.81 | 3.82 |
| SiO2 | 49.26 | 51.12 | 50.41 | 49.75 | 49.45 | 49.91 | 49.99 | 52.18 | 49.55 | 49.45 |
| K2O | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| CaO | 22.19 | 22.27 | 21.54 | 21.81 | 21.89 | 22.40 | 22.01 | 23.64 | 21.89 | 22.03 |
| TiO2 | 0.66 | 0.47 | 0.55 | 0.58 | 0.72 | 0.65 | 0.51 | 0.36 | 0.70 | 0.70 |
| MnO | 0.17 | 0.23 | 0.34 | 0.21 | 0.26 | 0.14 | 0.23 | 0.10 | 0.18 | 0.20 |
| FeOt | 7.23 | 7.21 | 8.38 | 7.95 | 8.61 | 6.12 | 8.14 | 4.80 | 8.41 | 8.69 |
| Total | 98.34 | 99.30 | 98.79 | 98.56 | 98.91 | 98.41 | 98.54 | 99.81 | 98.41 | 98.61 |
| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| Eruptive Unit | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| Label | VLS3.15.1 | VLS3.15.2 | VLS3.15.3 | VLS3.2.1 | VLS3.2.2 | VLS3.2.3 | VLS3.2.4 | VLS3.3.1 | VLS3.3.2 | VLS3.3.4 |
| | feld | feld | feld | cpx | cpx | cpx | ol | feld | feld | cpx |
| Na2O | 4.17 | 4.05 | 4.19 | 0.25 | 0.25 | 0.32 | 0.00 | 1.68 | 4.73 | 0.24 |
| MgO | 0.04 | 0.06 | 0.06 | 15.99 | 15.70 | 15.49 | 35.67 | 1.86 | 0.06 | 16.44 |
| Al2O3 | 28.66 | 28.91 | 29.11 | 2.44 | 3.01 | 3.06 | 0.03 | 18.96 | 27.96 | 2.21 |
| SiO2 | 52.87 | 52.27 | 52.55 | 51.39 | 51.13 | 50.98 | 37.20 | 58.04 | 54.68 | 52.60 |
| K2O | 1.09 | 1.02 | 1.03 | 0.00 | 0.01 | 0.03 | 0.02 | 3.84 | 1.59 | 0.01 |
| CaO | 11.39 | 11.80 | 11.46 | 22.75 | 22.86 | 22.61 | 0.37 | 4.32 | 9.92 | 23.40 |
| TiO2 | 0.04 | 0.05 | 0.04 | 0.41 | 0.47 | 0.51 | 0.00 | 0.72 | 0.04 | 0.33 |
| MnO | 0.01 | 0.00 | 0.00 | 0.11 | 0.12 | 0.07 | 0.57 | 0.16 | 0.01 | 0.13 |
| FeOt | 0.70 | 0.57 | 0.60 | 4.46 | 4.57 | 5.57 | 24.74 | 7.54 | 0.60 | 4.57 |
| Total | 98.98 | 98.73 | 99.05 | 97.79 | 98.10 | 98.63 | 98.60 | 97.12 | 99.59 | 99.94 |
| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| Eruptive Unit | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| Label | VLS3.3.5 | VLS3.3.6 | VLS3.3.7 | VLS3.3.8 | VLS3.3.9 | VLS3.5.1 | VLS3.5.10 | VLS3.5.2 | VLS3.5.3 | VLS3.5.4 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.19 | 0.17 | 0.21 | 0.44 | 0.44 | 0.41 | 0.44 | 0.32 | 0.29 | 0.44 |
| MgO | 17.14 | 17.10 | 16.14 | 14.03 | 13.81 | 13.19 | 12.43 | 15.21 | 16.09 | 13.12 |
| Al2O3 | 1.38 | 1.64 | 2.48 | 3.40 | 3.24 | 5.34 | 6.33 | 3.68 | 2.72 | 5.53 |
| SiO2 | 53.29 | 53.12 | 52.38 | 50.27 | 50.08 | 48.68 | 46.96 | 50.84 | 52.15 | 48.25 |
| K2O | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.07 | 0.01 | 0.00 | 0.04 |
| CaO | 22.72 | 23.42 | 23.05 | 21.99 | 21.88 | 21.95 | 21.17 | 22.61 | 23.00 | 21.61 |
| TiO2 | 0.27 | 0.24 | 0.35 | 0.60 | 0.59 | 0.84 | 1.01 | 0.63 | 0.40 | 0.96 |
| MnO | 0.14 | 0.11 | 0.15 | 0.27 | 0.29 | 0.18 | 0.28 | 0.15 | 0.13 | 0.26 |
| FeOt | 4.74 | 4.03 | 5.00 | 8.46 | 8.30 | 8.62 | 9.43 | 6.31 | 5.26 | 8.84 |
| Total | 99.88 | 99.84 | 99.77 | 99.45 | 98.64 | 99.22 | 98.12 | 99.74 | 100.05 | 99.06 |
| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| Eruptive Unit | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 |
| Label | VLS3.5.5 | VLS3.5.6 | VLS3.5.7 | VLS3.5.8 | VLS3.5.9 | VLS3.7.1 | VLS3.7.2 | VLS3.7.3 | VLS3.7.4 | VLS3.7.5 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.25 | 0.37 | 0.45 | 0.29 | 0.22 | 0.41 | 0.46 | 0.45 | 0.44 | 0.45 |
| MgO | 15.77 | 13.93 | 13.19 | 16.13 | 16.09 | 13.86 | 13.61 | 13.46 | 13.34 | 13.30 |
| Al2O3 | 2.89 | 3.62 | 5.15 | 2.63 | 2.98 | 3.93 | 3.62 | 3.76 | 4.16 | 4.12 |
| SiO2 | 51.57 | 50.21 | 48.49 | 51.94 | 50.93 | 49.95 | 49.93 | 49.84 | 49.87 | 49.60 |
| K2O | 0.00 | 0.06 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| CaO | 23.26 | 21.77 | 21.60 | 22.97 | 22.72 | 22.22 | 22.13 | 21.94 | 21.84 | 22.02 |
| TiO2 | 0.47 | 0.58 | 0.76 | 0.32 | 0.45 | 0.65 | 0.69 | 0.64 | 0.74 | 0.73 |
| MnO | 0.14 | 0.22 | 0.22 | 0.16 | 0.11 | 0.21 | 0.23 | 0.27 | 0.27 | 0.28 |
| FeOt | 4.86 | 8.34 | 8.89 | 5.01 | 5.06 | 8.14 | 8.17 | 8.79 | 8.72 | 8.64 |
| Total | 99.21 | 99.10 | 98.76 | 99.46 | 98.59 | 99.36 | 98.84 | 99.14 | 99.39 | 99.13 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Vulcanello3 | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | VLS3.9.1 | VLS3.9.2 | VLS3.9.3 | VLS3.9.4 | VLS3.9.5 | VloTr2c.1.1 | VloTr2c.1.2 | VloTr2c.2.1 | VloTr2c.2.2 | VloTr2c.2.3 |
| | cpx | cpx | cpx | cpx | ol | cpx | ol | cpx | cpx | cpx |
| **Na2O** | 0.44 | 0.44 | 0.44 | 0.49 | 0.02 | 0.26 | 0.00 | 0.43 | 0.47 | 0.50 |
| **MgO** | 14.04 | 13.80 | 13.20 | 13.57 | 33.94 | 15.39 | 32.26 | 13.74 | 13.74 | 13.65 |
| **Al2O3** | 2.91 | 3.57 | 4.69 | 3.77 | 0.02 | 3.68 | 0.02 | 3.66 | 3.54 | 4.03 |
| **SiO2** | 51.14 | 49.92 | 48.86 | 49.62 | 37.12 | 50.94 | 37.15 | 50.58 | 50.54 | 50.46 |
| **K2O** | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 |
| **CaO** | 21.73 | 22.12 | 22.01 | 22.01 | 0.37 | 22.78 | 0.29 | 22.07 | 22.09 | 22.02 |
| **TiO2** | 0.53 | 0.66 | 0.79 | 0.66 | 0.02 | 0.66 | 0.00 | 0.66 | 0.66 | 0.71 |
| **MnO** | 0.30 | 0.29 | 0.21 | 0.20 | 0.68 | 0.11 | 0.87 | 0.26 | 0.23 | 0.21 |
| **FeOt** | 8.65 | 8.50 | 8.75 | 8.62 | 26.36 | 6.11 | 29.76 | 8.69 | 8.60 | 8.90 |
| **Total** | 99.76 | 99.30 | 98.96 | 98.95 | 98.52 | 99.95 | 100.35 | 100.10 | 99.87 | 100.48 |
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | VloTr2c.3.1 | VloTr2c.4.1 | VloTr2c.5.1 | VloTr2c.5.2 | VloTr2c.6.2 | VloTr2c.6.3 | VloTr2c.6.4 | VloTr2c.8.1 | VloTr2c.8.2 | VloTr2c.9.1 |
| | feld | cpx | feld | cpx | feld | feld | feld | cpx | cpx | feld |
| **Na2O** | 5.43 | 0.44 | 4.97 | 0.38 | 5.16 | 5.25 | 5.29 | 0.18 | 0.25 | 4.63 |
| **MgO** | 0.04 | 13.67 | 0.00 | 12.18 | 0.06 | 0.05 | 0.07 | 17.25 | 16.92 | 0.00 |
| **Al2O3** | 27.07 | 3.54 | 19.60 | 2.52 | 27.33 | 27.30 | 27.41 | 1.20 | 1.89 | 20.35 |
| **SiO2** | 56.50 | 50.74 | 65.40 | 50.05 | 55.83 | 55.88 | 56.01 | 53.83 | 52.75 | 63.67 |
| **K2O** | 1.47 | 0.00 | 9.30 | 0.02 | 1.48 | 1.67 | 1.63 | 0.01 | 0.03 | 9.30 |
| **CaO** | 9.34 | 22.17 | 0.64 | 18.86 | 9.68 | 9.22 | 9.46 | 22.81 | 22.98 | 1.55 |
| **TiO2** | 0.01 | 0.68 | 0.12 | 0.58 | 0.05 | 0.04 | 0.05 | 0.23 | 0.24 | 0.13 |
| **MnO** | 0.00 | 0.31 | 0.00 | 0.65 | 0.00 | 0.00 | 0.00 | 0.16 | 0.12 | 0.00 |
| **FeOt** | 0.66 | 8.77 | 0.31 | 14.37 | 0.72 | 0.62 | 0.65 | 4.46 | 4.17 | 0.41 |
| **Total** | 100.51 | 100.32 | 100.34 | 99.62 | 100.30 | 100.01 | 100.55 | 100.14 | 99.36 | 100.05 |
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | VloTr2c.10.1 | VloTr2c.12.1 | VloTr2c.12.2 | VloTr2c.12.3 | VloTr2c.13.1 | VloTr2c.16.1 | VloTr2c.16.2 | VloTr2c.16.3 | VloTr2c.17.1 | VloTr2c.19.1 |
| | cpx | ol | cpx | cpx | feld | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.45 | 0.00 | 0.48 | 0.24 | 4.10 | 0.45 | 0.31 | 0.24 | 0.31 | 0.42 |
| **MgO** | 14.10 | 32.11 | 13.70 | 15.85 | 0.05 | 14.12 | 16.67 | 17.07 | 15.89 | 14.77 |
| **Al2O3** | 2.77 | 0.00 | 2.82 | 2.79 | 29.21 | 2.42 | 2.12 | 2.15 | 2.93 | 2.43 |
| **SiO2** | 51.20 | 36.95 | 50.99 | 52.06 | 53.13 | 51.50 | 52.69 | 51.94 | 52.12 | 52.08 |
| **K2O** | 0.00 | 0.00 | 0.04 | 0.02 | 0.85 | 0.00 | 0.03 | 0.03 | 0.00 | 0.02 |
| **CaO** | 21.62 | 0.30 | 21.47 | 23.16 | 12.08 | 21.56 | 22.79 | 22.69 | 22.87 | 21.73 |
| **TiO2** | 0.51 | 0.00 | 0.56 | 0.42 | 0.05 | 0.47 | 0.32 | 0.33 | 0.51 | 0.40 |
| **MnO** | 0.30 | 0.86 | 0.31 | 0.15 | 0.00 | 0.33 | 0.15 | 0.11 | 0.10 | 0.32 |
| **FeOt** | 9.09 | 30.11 | 9.29 | 5.39 | 0.61 | 9.18 | 4.89 | 4.58 | 5.05 | 8.02 |
| **Total** | 100.03 | 100.33 | 99.65 | 100.07 | 100.07 | 100.02 | 99.98 | 99.14 | 99.77 | 100.18 |
| **Date Analysed** | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| **Label** | VloTr2c.20.1 | VloTr2c.20.2 | VloTr2d.1.1 | VloTr2d.1.2 | VloTr2d.2.1 | VloTr2d.2.2 | VloTr2d.2.3 | VloTr2d.2.4 | VloTr2d.2.5 | VloTr2d.3.1 |
| | cpx | feld | cpx | cpx | feld | cpx | feld | feld | feld | cpx |
| **Na2O** | 0.33 | 5.20 | 0.46 | 0.45 | 5.13 | 0.29 | 5.41 | 5.64 | 5.12 | 0.29 |
| **MgO** | 14.68 | 0.06 | 13.73 | 13.89 | 0.06 | 16.19 | 0.04 | 0.05 | 0.05 | 16.03 |
| **Al2O3** | 2.75 | 27.82 | 3.67 | 3.25 | 26.76 | 2.69 | 26.48 | 25.95 | 27.33 | 2.90 |
| **SiO2** | 51.26 | 55.31 | 50.42 | 50.87 | 55.89 | 52.14 | 56.32 | 57.41 | 55.72 | 52.01 |
| **K2O** | 0.01 | 1.46 | 0.00 | 0.00 | 1.48 | 0.02 | 1.79 | 2.08 | 1.57 | 0.00 |
| **CaO** | 21.84 | 9.62 | 22.04 | 22.02 | 9.61 | 22.98 | 8.98 | 8.10 | 9.77 | 23.19 |
| **TiO2** | 0.43 | 0.06 | 0.63 | 0.54 | 0.04 | 0.47 | 0.02 | 0.06 | 0.05 | 0.53 |
| **MnO** | 0.27 | 0.00 | 0.29 | 0.24 | 0.07 | 0.06 | 0.01 | 0.00 | 0.02 | 0.11 |
| **FeOt** | 8.10 | 0.61 | 8.69 | 8.57 | 0.67 | 4.49 | 0.67 | 0.66 | 0.73 | 4.87 |
| **Total** | 99.67 | 100.16 | 99.93 | 99.83 | 99.72 | 99.32 | 99.73 | 99.93 | 100.35 | 99.93 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | VloTr2d.3.2 | VloTr2d.5.1 | VloTr2d.5.2 | VloTr2d.5.3 | VloTr2d.5.4 | VloTr2d.5.5 | VloTr2d.6.1 | VloTr2d.6.2 | VloTr2d.6.3 | VloTr2d.6.4 |
| | feld | cpx | cpx | cpx | cpx | cpx | cpx | cpx | ol | ol |
| Na2O | 4.99 | 0.48 | 0.49 | 0.46 | 0.47 | 0.27 | 0.24 | 0.29 | 0.00 | 0.00 |
| MgO | 0.04 | 13.72 | 13.99 | 13.95 | 13.80 | 16.44 | 16.62 | 16.00 | 32.21 | 31.99 |
| Al2O3 | 27.68 | 2.83 | 2.73 | 2.46 | 2.89 | 2.12 | 2.27 | 3.00 | 0.00 | 0.00 |
| SiO2 | 55.59 | 50.94 | 51.40 | 51.38 | 51.30 | 52.64 | 52.34 | 51.14 | 36.32 | 36.52 |
| K2O | 1.40 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 |
| CaO | 10.21 | 21.52 | 21.41 | 21.59 | 21.50 | 23.19 | 23.33 | 22.80 | 0.29 | 0.30 |
| TiO2 | 0.07 | 0.54 | 0.52 | 0.48 | 0.56 | 0.34 | 0.32 | 0.40 | 0.02 | 0.00 |
| MnO | 0.00 | 0.37 | 0.31 | 0.37 | 0.35 | 0.16 | 0.08 | 0.15 | 0.86 | 0.81 |
| FeOt | 0.66 | 9.31 | 9.12 | 9.25 | 9.19 | 4.61 | 3.67 | 5.36 | 30.43 | 30.56 |
| Total | 100.66 | 99.71 | 99.96 | 99.94 | 100.08 | 99.77 | 98.90 | 99.15 | 100.14 | 100.18 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | VloTr2d.7.1 | VloTr2d.9.1 | VloTr2d.9.2 | VloTr2d.9.3 | VloTr2d.10.1 | VloTr2d.10.2 | VloTr2d.10.3 | VloTr2d.11.1 | VloTr2d.11.2 | VloTr2d.11.3 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | feld | cpx |
| Na2O | 0.29 | 0.31 | 0.25 | 0.18 | 0.45 | 0.21 | 0.44 | 0.44 | 5.22 | 0.41 |
| MgO | 16.12 | 15.24 | 16.35 | 17.59 | 14.15 | 16.41 | 13.88 | 14.07 | 0.06 | 13.79 |
| Al2O3 | 2.65 | 2.99 | 2.56 | 1.30 | 2.89 | 2.33 | 2.78 | 2.76 | 27.15 | 3.34 |
| SiO2 | 51.75 | 51.67 | 52.33 | 53.71 | 51.43 | 52.84 | 50.87 | 51.40 | 56.31 | 50.83 |
| K2O | 0.01 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 1.71 | 0.00 |
| CaO | 23.22 | 22.48 | 23.29 | 23.01 | 21.80 | 23.73 | 21.70 | 21.39 | 9.36 | 21.44 |
| TiO2 | 0.43 | 0.44 | 0.43 | 0.25 | 0.54 | 0.33 | 0.52 | 0.45 | 0.05 | 0.57 |
| MnO | 0.17 | 0.13 | 0.13 | 0.15 | 0.26 | 0.08 | 0.36 | 0.30 | 0.00 | 0.30 |
| FeOt | 4.82 | 6.66 | 4.08 | 4.22 | 8.74 | 4.37 | 9.00 | 8.96 | 0.66 | 9.29 |
| Total | 99.46 | 99.93 | 99.42 | 100.43 | 100.25 | 100.29 | 99.55 | 99.77 | 100.52 | 99.98 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | VloTr2d.12.1 | VloTr2d.12.2 | VloTr2d.12.3 | VloTr2d.13.1 | VloTr2d.13.2 | VloTr2d.13.3 | VloTr2d.13.4 | VloTr2d.13.5 | VloTr2d.14.1 | VloTr2d.15.1 |
| | cpx | feld | feld | cpx | cpx | cpx | cpx | cpx | feld | ol |
| Na2O | 0.51 | 4.86 | 5.33 | 0.49 | 0.47 | 0.39 | 0.26 | 0.39 | 5.22 | 0.04 |
| MgO | 14.00 | 0.07 | 0.06 | 13.51 | 13.88 | 14.07 | 16.55 | 14.42 | 0.07 | 32.32 |
| Al2O3 | 2.79 | 28.64 | 26.72 | 3.16 | 3.05 | 4.10 | 1.46 | 3.84 | 26.90 | 0.00 |
| SiO2 | 51.13 | 54.13 | 56.54 | 51.07 | 51.07 | 49.74 | 53.42 | 50.35 | 56.15 | 36.99 |
| K2O | 0.00 | 0.85 | 1.73 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 1.82 | 0.00 |
| CaO | 21.59 | 10.85 | 9.07 | 21.42 | 21.52 | 22.29 | 23.32 | 22.30 | 9.15 | 0.31 |
| TiO2 | 0.54 | 0.03 | 0.04 | 0.58 | 0.58 | 0.70 | 0.22 | 0.52 | 0.07 | 0.01 |
| MnO | 0.34 | 0.00 | 0.01 | 0.35 | 0.38 | 0.24 | 0.12 | 0.21 | 0.00 | 0.79 |
| FeOt | 9.20 | 0.61 | 0.67 | 9.38 | 9.31 | 8.24 | 4.64 | 8.05 | 0.67 | 29.66 |
| Total | 100.10 | 100.05 | 100.17 | 99.98 | 100.29 | 99.78 | 100.00 | 100.07 | 100.04 | 100.12 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte | Pietre Cotte |
| Label | VloTr2d.15.2 | VloTr2d.16.1 | VloTr2d.16.2 | VloTr2d.16.3 | VloTr2d.16.4 | VloTr2d.16.5 | VloTr2d.16.6 | VloTr2d.17.1 | VloTr2d.17.2 | VloTr2d.17.3 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | feld | ol | feld |
| Na2O | 0.25 | 0.45 | 0.37 | 0.36 | 0.48 | 0.32 | 0.49 | 4.89 | 0.00 | 4.92 |
| MgO | 16.18 | 13.82 | 13.94 | 14.19 | 14.22 | 15.03 | 13.79 | 0.05 | 32.53 | 0.07 |
| Al2O3 | 2.31 | 3.51 | 4.25 | 3.91 | 2.71 | 3.71 | 2.97 | 26.91 | 0.04 | 27.32 |
| SiO2 | 53.03 | 50.57 | 50.15 | 50.53 | 51.35 | 50.89 | 51.28 | 54.84 | 36.67 | 55.58 |
| K2O | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 1.36 | 0.00 | 1.43 |
| CaO | 23.33 | 22.02 | 22.17 | 22.27 | 21.48 | 22.64 | 21.49 | 10.20 | 0.31 | 9.95 |
| TiO2 | 0.39 | 0.60 | 0.62 | 0.55 | 0.50 | 0.51 | 0.56 | 0.04 | 0.01 | 0.06 |
| MnO | 0.12 | 0.25 | 0.18 | 0.18 | 0.38 | 0.13 | 0.31 | 0.00 | 0.79 | 0.00 |
| FeOt | 4.67 | 8.66 | 8.23 | 7.95 | 8.98 | 6.79 | 9.46 | 0.69 | 30.25 | 0.59 |
| Total | 100.28 | 99.90 | 99.90 | 99.94 | 100.10 | 100.00 | 100.37 | 98.97 | 100.61 | 99.92 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Eruptive Unit** | Pietre Cotte | Pietre Cotte | Pietre Cotte | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | MoTr2d.17.4 | MoTr2d.17.5 | MoTr2d.18.1 | AT17.16.1 | AT17.16.2 | AT17.16.3 | AT17.16.4 | AT17.17.1 | AT17.17.2 | AT17.17.3 |
| | feld | feld | feld | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 5.27 | 5.10 | 5.01 | 0.45 | 0.47 | 0.35 | 0.45 | 0.45 | 0.48 | 0.42 |
| **MgO** | 0.06 | 0.06 | 0.06 | 13.76 | 13.90 | 14.44 | 13.80 | 14.22 | 13.89 | 14.11 |
| **Al2O3** | 26.63 | 27.51 | 27.33 | 3.46 | 3.51 | 2.71 | 3.36 | 2.84 | 3.32 | 3.03 |
| **SiO2** | 56.47 | 55.18 | 55.61 | 50.31 | 50.16 | 50.69 | 50.39 | 50.95 | 50.57 | 50.81 |
| **K2O** | 1.70 | 1.52 | 1.52 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 |
| **CaO** | 9.22 | 9.64 | 10.01 | 22.07 | 22.05 | 22.23 | 21.96 | 21.97 | 21.83 | 22.14 |
| **TiO2** | 0.01 | 0.04 | 0.06 | 0.63 | 0.61 | 0.46 | 0.58 | 0.53 | 0.59 | 0.55 |
| **MnO** | 0.01 | 0.00 | 0.00 | 0.27 | 0.31 | 0.23 | 0.24 | 0.27 | 0.30 | 0.28 |
| **FeOt** | 0.60 | 0.61 | 0.69 | 8.66 | 8.58 | 7.75 | 8.54 | 8.76 | 8.82 | 8.49 |
| **Total** | 99.96 | 99.65 | 100.30 | 99.61 | 99.59 | 98.87 | 99.33 | 100.00 | 99.80 | 99.83 |
| **Date Analysed** | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi |
| **Label** | AT17.17.4 | AT17.17.5 | AT17.17.6 | AT17.17.7 | AT17.18.1 | AT17.18.2 | AT17.19.1 | AT17.19.2 | AT17.19.3 | AT17.20.1 |
| | cpx | cpx | cpx | feld | cpx | cpx | ol | cpx | cpx | cpx |
| **Na2O** | 0.31 | 0.49 | 0.49 | 4.86 | 0.36 | 0.50 | 0.02 | 0.25 | 0.34 | 0.39 |
| **MgO** | 14.74 | 13.87 | 13.69 | 0.06 | 15.44 | 13.51 | 33.40 | 15.68 | 14.23 | 13.85 |
| **Al2O3** | 3.47 | 3.41 | 3.63 | 27.17 | 2.32 | 3.87 | 0.01 | 3.17 | 3.42 | 3.48 |
| **SiO2** | 50.76 | 50.41 | 50.30 | 55.51 | 51.98 | 49.87 | 36.95 | 51.34 | 50.47 | 50.12 |
| **K2O** | 0.00 | 0.00 | 0.01 | 1.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| **CaO** | 22.77 | 21.79 | 22.06 | 9.40 | 22.72 | 22.04 | 0.33 | 23.39 | 22.54 | 22.30 |
| **TiO2** | 0.48 | 0.58 | 0.61 | 0.04 | 0.29 | 0.68 | 0.00 | 0.54 | 0.41 | 0.63 |
| **MnO** | 0.23 | 0.26 | 0.27 | 0.00 | 0.10 | 0.22 | 0.86 | 0.19 | 0.17 | 0.31 |
| **FeOt** | 6.80 | 8.41 | 8.62 | 0.79 | 6.19 | 9.13 | 29.11 | 5.09 | 7.65 | 8.13 |
| **Total** | 99.55 | 99.23 | 99.67 | 99.71 | 99.40 | 99.82 | 100.69 | 99.65 | 99.22 | 99.22 |
| **Date Analysed** | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Palizzi | Palizzi | Palizzi | Palizzi | Palizzi | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 |
| **Label** | AT17.20.2 | AT17.20.3 | AT17.21.1 | AT17.21.2 | AT17.21.3 | AT3.1.1 | AT3.1.2 | AT3.1.3 | AT3.1.4 | AT3.1.5 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.43 | 0.41 | 0.45 | 0.43 | 0.48 | 0.49 | 0.48 | 0.39 | 0.46 | 0.40 |
| **MgO** | 13.65 | 14.06 | 14.06 | 13.32 | 13.71 | 13.58 | 13.86 | 13.64 | 13.81 | 13.79 |
| **Al2O3** | 3.70 | 3.09 | 2.85 | 4.07 | 3.49 | 3.36 | 3.34 | 3.55 | 3.50 | 3.55 |
| **SiO2** | 50.07 | 51.03 | 50.96 | 49.62 | 50.54 | 51.00 | 51.23 | 50.84 | 50.36 | 49.89 |
| **K2O** | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 |
| **CaO** | 22.13 | 22.08 | 21.92 | 22.27 | 21.91 | 22.64 | 21.48 | 21.73 | 22.78 | 22.36 |
| **TiO2** | 0.67 | 0.55 | 0.49 | 0.74 | 0.58 | 0.67 | 0.63 | 0.60 | 0.63 | 0.63 |
| **MnO** | 0.27 | 0.25 | 0.32 | 0.28 | 0.33 | 0.33 | 0.25 | 0.25 | 0.28 | 0.26 |
| **FeOt** | 8.23 | 7.90 | 8.40 | 8.83 | 8.88 | 8.68 | 9.10 | 8.89 | 8.69 | 8.64 |
| **Total** | 99.15 | 99.38 | 99.46 | 99.55 | 99.92 | 100.74 | 100.39 | 99.89 | 100.50 | 99.52 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 |
| **Label** | AT3.1.6 | AT3.10.1 | AT3.10.2 | AT3.10.3 | AT3.10.4 | AT3.10.5 | AT3.10.6 | AT3.10.7 | AT3.11.1 | AT3.11.2 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.50 | 0.50 | 0.46 | 0.47 | 0.42 | 0.39 | 0.44 | 0.45 | 0.51 | 0.47 |
| **MgO** | 13.58 | 13.77 | 13.85 | 13.67 | 13.75 | 13.61 | 14.07 | 13.89 | 13.60 | 13.55 |
| **Al2O3** | 4.20 | 3.24 | 3.09 | 3.47 | 3.15 | 3.64 | 2.89 | 3.51 | 3.79 | 3.54 |
| **SiO2** | 50.30 | 51.29 | 51.53 | 51.02 | 51.06 | 50.60 | 50.99 | 50.46 | 50.49 | 50.21 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 |
| **CaO** | 21.02 | 23.36 | 22.35 | 22.96 | 22.97 | 21.98 | 22.56 | 21.69 | 21.04 | 23.10 |
| **TiO2** | 0.64 | 0.56 | 0.55 | 0.56 | 0.56 | 0.63 | 0.53 | 0.60 | 0.71 | 0.75 |
| **MnO** | 0.27 | 0.33 | 0.22 | 0.25 | 0.25 | 0.21 | 0.29 | 0.28 | 0.27 | 0.21 |
| **FeOt** | 8.89 | 8.41 | 8.63 | 9.08 | 8.83 | 9.02 | 8.48 | 8.89 | 9.41 | 8.71 |
| **Total** | 99.38 | 101.47 | 100.70 | 101.49 | 101.01 | 100.08 | 100.25 | 99.80 | 99.82 | 100.54 |

| Eruptive Unit | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | AT3.11.3 | AT3.11.4 | AT3.11.5 | AT3.12.1 | AT3.12.2 | AT3.12.3 | AT3.12.4 | AT3.12.5 | AT3.13.1 | AT3.13.2 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.44 | 0.49 | 0.48 | 0.39 | 0.38 | 0.37 | 0.43 | 0.45 | 0.42 | 0.46 |
| **MgO** | 13.55 | 13.53 | 13.61 | 13.17 | 13.53 | 13.14 | 13.66 | 13.45 | 13.59 | 14.13 |
| **Al2O3** | 3.27 | 3.61 | 3.49 | 4.65 | 3.64 | 4.83 | 3.52 | 3.91 | 3.70 | 3.29 |
| **SiO2** | 49.87 | 50.67 | 49.71 | 49.71 | 50.96 | 49.40 | 50.94 | 50.64 | 50.35 | 50.72 |
| **K2O** | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01 | 0.00 |
| **CaO** | 23.06 | 21.89 | 22.25 | 22.40 | 21.54 | 22.81 | 22.20 | 22.52 | 22.77 | 22.22 |
| **TiO2** | 0.68 | 0.62 | 0.68 | 0.83 | 0.64 | 0.86 | 0.63 | 0.65 | 0.66 | 0.58 |
| **MnO** | 0.22 | 0.27 | 0.23 | 0.21 | 0.31 | 0.28 | 0.24 | 0.23 | 0.27 | 0.20 |
| **FeOt** | 8.88 | 9.15 | 9.14 | 9.18 | 8.76 | 9.36 | 8.91 | 8.96 | 8.80 | 8.27 |
| **Total** | 99.97 | 100.22 | 99.58 | 100.56 | 99.76 | 101.06 | 100.54 | 100.81 | 100.57 | 99.89 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 |
| **Label** | AT3.13.3 | AT3.13.4 | AT3.13.5 | AT3.2.1 | AT3.2.2 | AT3.2.3 | AT3.2.4 | AT3.2.5 | AT3.3.1 | AT3.3.2 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.30 | 0.37 | 0.39 | 0.45 | 0.40 | 0.39 | 0.46 | 0.34 | 0.39 | 0.41 |
| **MgO** | 14.17 | 14.56 | 14.07 | 13.72 | 14.71 | 14.15 | 13.76 | 14.92 | 13.85 | 13.67 |
| **Al2O3** | 4.35 | 3.06 | 3.88 | 3.52 | 2.04 | 2.89 | 3.49 | 2.67 | 3.62 | 3.75 |
| **SiO2** | 49.46 | 51.78 | 50.75 | 50.83 | 52.12 | 50.84 | 50.62 | 51.91 | 50.62 | 50.27 |
| **K2O** | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.02 | 0.02 | 0.01 |
| **CaO** | 22.50 | 22.65 | 22.13 | 21.92 | 22.40 | 20.94 | 22.49 | 23.88 | 22.74 | 22.56 |
| **TiO2** | 0.77 | 0.49 | 0.66 | 0.63 | 0.39 | 0.53 | 0.67 | 0.40 | 0.60 | 0.69 |
| **MnO** | 0.11 | 0.28 | 0.20 | 0.25 | 0.27 | 0.25 | 0.31 | 0.14 | 0.17 | 0.30 |
| **FeOt** | 7.75 | 7.70 | 8.35 | 9.00 | 8.29 | 8.86 | 8.99 | 6.98 | 8.38 | 8.84 |
| **Total** | 99.43 | 100.90 | 100.44 | 100.32 | 100.61 | 98.85 | 100.78 | 101.27 | 100.38 | 100.50 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 |
| **Label** | AT3.3.3 | AT3.3.4 | AT3.3.5 | AT3.4.1 | AT3.4.2 | AT3.4.3 | AT3.4.4 | AT3.4.5 | AT3.4.6 | AT3.4.7 |
| | cpx | cpx | cpx | ol | ol | feld | feld | cpx | cpx | cpx |
| **Na2O** | 0.40 | 0.34 | 0.44 | 0.02 | 0.04 | 3.41 | 3.43 | 0.38 | 0.38 | 0.49 |
| **MgO** | 14.19 | 14.50 | 13.43 | 34.33 | 34.80 | 2.21 | 2.18 | 14.18 | 14.28 | 14.02 |
| **Al2O3** | 3.45 | 3.48 | 3.67 | 0.03 | 0.04 | 17.59 | 17.70 | 3.46 | 3.41 | 3.87 |
| **SiO2** | 50.31 | 51.31 | 50.69 | 37.88 | 37.78 | 55.75 | 55.32 | 50.58 | 50.99 | 50.36 |
| **K2O** | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 6.05 | 6.01 | 0.00 | 0.01 | 0.00 |
| **CaO** | 22.81 | 22.21 | 23.38 | 0.36 | 0.35 | 4.79 | 4.61 | 23.13 | 22.14 | 21.46 |
| **TiO2** | 0.64 | 0.50 | 0.71 | 0.03 | 0.02 | 0.72 | 0.70 | 0.59 | 0.56 | 0.65 |
| **MnO** | 0.22 | 0.17 | 0.24 | 0.78 | 0.60 | 0.16 | 0.17 | 0.20 | 0.26 | 0.17 |
| **FeOt** | 8.15 | 7.51 | 8.56 | 28.47 | 27.16 | 7.34 | 7.30 | 8.49 | 8.71 | 8.19 |
| **Total** | 100.17 | 100.01 | 101.13 | 101.89 | 100.79 | 98.02 | 97.42 | 101.01 | 100.74 | 99.20 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 |
| **Label** | AT3.5.1 | AT3.5.2 | AT3.5.3 | AT3.5.4 | AT3.5.5 | AT3.6.1 | AT3.6.2 | AT3.6.3 | AT3.6.4 | AT3.6.5 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.47 | 0.24 | 0.34 | 0.32 | 0.49 | 0.44 | 0.49 | 0.41 | 0.44 | 0.41 |
| **MgO** | 13.81 | 16.52 | 14.79 | 15.14 | 13.42 | 13.65 | 13.63 | 13.72 | 13.36 | 13.06 |
| **Al2O3** | 3.43 | 1.94 | 3.07 | 2.42 | 3.70 | 3.34 | 3.34 | 3.14 | 3.91 | 4.30 |
| **SiO2** | 50.88 | 52.87 | 51.01 | 51.19 | 50.69 | 51.13 | 50.95 | 51.35 | 50.75 | 50.01 |
| **K2O** | 0.03 | 0.01 | 0.01 | 0.02 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 |
| **CaO** | 22.49 | 22.92 | 22.27 | 22.30 | 21.24 | 22.22 | 21.84 | 21.76 | 21.86 | 23.36 |
| **TiO2** | 0.63 | 0.33 | 0.59 | 0.39 | 0.66 | 0.58 | 0.60 | 0.60 | 0.73 | 0.80 |
| **MnO** | 0.31 | 0.15 | 0.23 | 0.19 | 0.25 | 0.29 | 0.29 | 0.22 | 0.29 | 0.26 |
| **FeOt** | 8.92 | 5.48 | 7.61 | 7.48 | 8.98 | 9.02 | 8.96 | 8.87 | 9.11 | 8.97 |
| **Total** | 100.97 | 100.45 | 99.92 | 99.46 | 99.46 | 100.68 | 100.11 | 100.07 | 100.46 | 101.17 |

| Eruptive Unit | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | AT3.7.1 | AT3.7.2 | AT3.7.3 | AT3.7.4 | AT3.7.5 | AT3.8.1 | AT3.8.2 | AT3.8.3 | AT3.8.4 | AT3.8.5 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.50 | 0.50 | 0.53 | 0.46 | 0.53 | 0.40 | 0.45 | 0.48 | 0.43 | 0.45 |
| **MgO** | 13.62 | 13.60 | 13.65 | 13.60 | 13.88 | 13.83 | 13.84 | 13.38 | 13.39 | 13.81 |
| **Al2O3** | 3.74 | 3.84 | 3.66 | 3.84 | 3.52 | 3.87 | 3.88 | 4.06 | 3.97 | 3.45 |
| **SiO2** | 50.59 | 50.45 | 50.56 | 50.03 | 51.12 | 50.15 | 50.62 | 50.70 | 50.48 | 50.50 |
| **K2O** | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **CaO** | 22.22 | 21.37 | 21.20 | 23.14 | 22.11 | 23.11 | 22.07 | 21.29 | 22.59 | 21.67 |
| **TiO2** | 0.61 | 0.69 | 0.63 | 0.65 | 0.53 | 0.71 | 0.64 | 0.67 | 0.76 | 0.64 |
| **MnO** | 0.32 | 0.23 | 0.27 | 0.27 | 0.25 | 0.21 | 0.24 | 0.25 | 0.30 | 0.26 |
| **FeOt** | 8.97 | 9.04 | 8.90 | 9.02 | 8.89 | 8.69 | 8.75 | 8.86 | 8.94 | 8.95 |
| **Total** | 100.58 | 99.73 | 99.43 | 101.01 | 100.84 | 100.97 | 100.49 | 99.69 | 100.86 | 99.73 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
| **Eruptive Unit** | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello2 | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform |
| **Label** | AT3.9.1 | AT3.9.2 | AT3.9.3 | AT3.9.4 | AT3.9.5 | AT16.1.1 | AT16.1.10 | AT16.1.2 | AT16.1.3 | AT16.1.4 |
| | cpx | cpx | cpx | cpx | cpx | feld | cpx | feld | cpx | cpx |
| **Na2O** | 0.45 | 0.26 | 0.24 | 0.46 | 0.45 | 6.38 | 0.29 | 5.81 | 0.40 | 0.36 |
| **MgO** | 14.04 | 16.55 | 16.98 | 14.04 | 13.73 | 0.00 | 14.93 | 0.00 | 13.62 | 13.56 |
| **Al2O3** | 3.44 | 1.50 | 1.49 | 3.26 | 3.35 | 21.03 | 4.03 | 20.79 | 3.47 | 3.42 |
| **SiO2** | 50.75 | 53.50 | 53.42 | 51.22 | 51.27 | 65.69 | 50.41 | 65.75 | 50.64 | 50.71 |
| **K2O** | 0.00 | 0.01 | 0.00 | 0.01 | 0.02 | 7.02 | 0.02 | 7.26 | 0.00 | 0.00 |
| **CaO** | 22.74 | 22.74 | 23.22 | 21.61 | 21.89 | 1.23 | 23.24 | 1.29 | 22.17 | 22.14 |
| **TiO2** | 0.61 | 0.29 | 0.28 | 0.54 | 0.60 | 0.10 | 0.74 | 0.09 | 0.59 | 0.58 |
| **MnO** | 0.27 | 0.19 | 0.15 | 0.31 | 0.25 | 0.02 | 0.14 | 0.03 | 0.22 | 0.24 |
| **FeOt** | 8.82 | 5.24 | 4.68 | 8.22 | 8.80 | 0.40 | 5.95 | 0.42 | 8.60 | 8.53 |
| **Total** | 101.14 | 100.27 | 100.46 | 99.67 | 100.36 | 101.87 | 99.74 | 101.45 | 99.72 | 99.53 |
| **Date Analysed** | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
| **Eruptive Unit** | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform |
| **Label** | AT16.1.5 | AT16.1.7 | AT16.1.8 | AT16.1.9 | AT16.10.1 | AT16.11.1 | AT16.11.2 | AT16.11.3 | AT16.11.4 | AT16.11.5 |
| | ol | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | feld |
| **Na2O** | 0.00 | 0.49 | 0.29 | 0.48 | 0.26 | 0.43 | 0.47 | 0.41 | 0.25 | 4.66 |
| **MgO** | 28.77 | 13.35 | 15.25 | 13.24 | 15.69 | 13.26 | 13.04 | 14.10 | 15.04 | 0.08 |
| **Al2O3** | 0.01 | 3.59 | 2.15 | 3.61 | 2.89 | 4.26 | 4.23 | 4.51 | 3.22 | 28.39 |
| **SiO2** | 36.85 | 50.61 | 52.52 | 50.48 | 51.77 | 49.94 | 50.05 | 50.03 | 51.66 | 55.05 |
| **K2O** | 0.04 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 1.40 |
| **CaO** | 0.37 | 22.21 | 22.74 | 21.82 | 23.18 | 22.27 | 21.94 | 22.50 | 23.12 | 10.31 |
| **TiO2** | 0.01 | 0.62 | 0.31 | 0.63 | 0.45 | 0.78 | 0.78 | 0.87 | 0.54 | 0.03 |
| **MnO** | 0.97 | 0.25 | 0.17 | 0.30 | 0.17 | 0.24 | 0.29 | 0.19 | 0.09 | 0.00 |
| **FeOt** | 31.52 | 8.40 | 6.46 | 9.07 | 5.18 | 8.59 | 9.26 | 6.94 | 5.98 | 0.70 |
| **Total** | 98.54 | 99.52 | 99.90 | 99.62 | 99.58 | 99.78 | 100.05 | 99.55 | 99.92 | 100.61 |
| **Date Analysed** | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
| **Eruptive Unit** | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform |
| **Label** | AT16.12.1 | AT16.12.2 | AT16.13.1 | AT16.14.1 | AT16.16.1 | AT16.17.1 | AT16.18.1 | AT16.19.1 | AT16.2.1 | AT16.2.10 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | feld |
| **Na2O** | 0.26 | 0.44 | 0.25 | 0.42 | 0.48 | 0.40 | 0.45 | 0.44 | 0.29 | 4.44 |
| **MgO** | 15.75 | 14.55 | 16.34 | 13.49 | 13.57 | 13.59 | 13.38 | 14.42 | 14.32 | 0.08 |
| **Al2O3** | 2.96 | 4.48 | 2.24 | 3.88 | 3.31 | 3.60 | 3.82 | 2.32 | 3.99 | 27.90 |
| **SiO2** | 52.04 | 50.83 | 53.20 | 50.61 | 50.98 | 50.61 | 50.73 | 52.06 | 50.96 | 54.41 |
| **K2O** | 0.00 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 1.34 |
| **CaO** | 23.38 | 23.12 | 23.32 | 22.24 | 22.08 | 22.37 | 22.19 | 22.17 | 22.72 | 10.78 |
| **TiO2** | 0.49 | 0.50 | 0.28 | 0.61 | 0.65 | 0.63 | 0.66 | 0.44 | 0.73 | 0.04 |
| **MnO** | 0.09 | 0.11 | 0.09 | 0.19 | 0.35 | 0.17 | 0.27 | 0.21 | 0.14 | 0.01 |
| **FeOt** | 5.08 | 6.48 | 4.27 | 8.43 | 8.46 | 8.20 | 9.00 | 7.74 | 6.17 | 0.74 |
| **Total** | 100.05 | 100.61 | 100.00 | 99.87 | 99.88 | 99.55 | 100.48 | 99.80 | 99.33 | 99.75 |

| Eruptive Unit | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform |
|---|---|---|---|---|---|---|---|---|---|---|
| Label | AT16.2.2 | AT16.2.3 | AT16.2.4 | AT16.2.5 | AT16.2.6 | AT16.2.7 | AT16.2.8 | AT16.2.9 | AT16.20.1 | AT16.3.1 |
| | cpx | cpx | cpx | feld | feld | cpx | cpx | feld | cpx | cpx |
| Na2O | 0.24 | 0.16 | 0.33 | 4.64 | 4.41 | 0.44 | 0.19 | 4.61 | 0.42 | 0.47 |
| MgO | 16.29 | 16.72 | 14.77 | 0.08 | 0.07 | 13.43 | 16.72 | 0.07 | 13.50 | 12.92 |
| Al2O3 | 2.17 | 1.70 | 3.48 | 27.98 | 28.58 | 3.64 | 1.82 | 28.22 | 3.68 | 4.40 |
| SiO2 | 53.07 | 53.45 | 51.03 | 54.74 | 54.50 | 50.63 | 53.18 | 55.01 | 50.38 | 49.89 |
| K2O | 0.00 | 0.01 | 0.01 | 1.18 | 1.27 | 0.00 | 0.01 | 1.49 | 0.01 | 0.02 |
| CaO | 23.54 | 22.56 | 22.75 | 10.65 | 10.95 | 22.27 | 22.76 | 10.40 | 22.53 | 22.05 |
| TiO2 | 0.32 | 0.31 | 0.63 | 0.02 | 0.04 | 0.63 | 0.28 | 0.06 | 0.64 | 0.75 |
| MnO | 0.12 | 0.18 | 0.11 | 0.04 | 0.00 | 0.29 | 0.08 | 0.00 | 0.27 | 0.25 |
| FeOt | 4.41 | 4.93 | 6.28 | 0.64 | 0.75 | 8.64 | 4.67 | 0.76 | 8.70 | 9.08 |
| Total | 100.17 | 100.01 | 99.38 | 99.97 | 100.56 | 99.98 | 99.70 | 100.61 | 100.14 | 99.84 |
| Date Analysed | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
| Eruptive Unit | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform |
| Label | AT16.3.10 | AT16.3.11 | AT16.3.2 | AT16.3.3 | AT16.3.4 | AT16.3.5 | AT16.3.6 | AT16.3.7 | AT16.3.8 | AT16.3.9 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.48 | 0.18 | 0.45 | 0.27 | 0.42 | 0.38 | 0.49 | 0.46 | 0.30 | 0.50 |
| MgO | 13.29 | 16.82 | 13.05 | 15.24 | 13.54 | 14.04 | 13.88 | 13.42 | 14.92 | 13.41 |
| Al2O3 | 3.71 | 1.49 | 4.59 | 2.82 | 4.13 | 4.28 | 3.32 | 3.49 | 3.12 | 4.08 |
| SiO2 | 49.98 | 53.50 | 49.33 | 51.76 | 49.62 | 50.10 | 50.61 | 50.68 | 51.30 | 49.84 |
| K2O | 0.00 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.02 |
| CaO | 22.19 | 23.07 | 22.16 | 23.28 | 22.25 | 22.60 | 21.76 | 22.12 | 22.90 | 22.01 |
| TiO2 | 0.62 | 0.24 | 0.74 | 0.46 | 0.67 | 0.73 | 0.56 | 0.62 | 0.56 | 0.69 |
| MnO | 0.24 | 0.12 | 0.18 | 0.11 | 0.26 | 0.16 | 0.26 | 0.25 | 0.14 | 0.24 |
| FeOt | 8.71 | 4.40 | 8.91 | 5.92 | 8.37 | 7.37 | 8.35 | 8.26 | 6.24 | 8.98 |
| Total | 99.21 | 99.83 | 99.43 | 99.88 | 99.27 | 99.66 | 99.25 | 99.30 | 99.49 | 99.77 |
| Date Analysed | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
| Eruptive Unit | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform |
| Label | AT16.4.1 | AT16.4.2 | AT16.5.1 | AT16.5.2 | AT16.5.3 | AT16.5.4 | AT16.5.5 | AT16.5.6 | AT16.5.7 | AT16.6.1 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.29 | 0.47 | 0.40 | 0.24 | 0.48 | 0.36 | 0.20 | 0.21 | 0.28 | 0.33 |
| MgO | 15.89 | 13.61 | 13.79 | 15.65 | 13.57 | 13.88 | 16.03 | 16.13 | 15.31 | 14.51 |
| Al2O3 | 2.66 | 3.54 | 3.24 | 3.23 | 3.21 | 4.38 | 2.68 | 2.19 | 3.26 | 3.84 |
| SiO2 | 52.50 | 50.85 | 51.00 | 51.28 | 50.88 | 49.80 | 52.38 | 53.07 | 51.80 | 50.98 |
| K2O | 0.02 | 0.01 | 0.00 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 |
| CaO | 22.74 | 22.34 | 21.83 | 23.05 | 21.99 | 22.67 | 23.28 | 23.70 | 23.21 | 22.65 |
| TiO2 | 0.38 | 0.61 | 0.61 | 0.43 | 0.63 | 0.68 | 0.39 | 0.31 | 0.54 | 0.62 |
| MnO | 0.14 | 0.20 | 0.26 | 0.14 | 0.26 | 0.14 | 0.08 | 0.12 | 0.09 | 0.11 |
| FeOt | 5.22 | 8.50 | 8.73 | 5.72 | 8.85 | 7.15 | 4.60 | 4.50 | 5.69 | 6.95 |
| Total | 99.83 | 100.13 | 99.87 | 99.77 | 99.88 | 99.05 | 99.66 | 100.23 | 100.18 | 99.99 |
| Date Analysed | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| Eruptive Unit | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello Platform | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| Label | AT16.6.2 | AT16.7.1 | AT16.7.2 | AT16.7.3 | AT16.7.4 | AT16.8.1 | AT16.9.1 | AT8.1.1 | AT8.1.2 | AT8.1.3 |
| | cpx | cpx | cpx | cpx | cpx | cpx | ol | feld | feld | feld |
| Na2O | 0.45 | 0.40 | 0.26 | 0.28 | 0.45 | 0.31 | 0.00 | 4.76 | 4.63 | 3.21 |
| MgO | 13.97 | 13.35 | 15.01 | 15.76 | 13.30 | 15.94 | 33.85 | 0.07 | 0.06 | 0.07 |
| Al2O3 | 3.23 | 4.10 | 3.57 | 2.95 | 4.11 | 2.58 | 0.00 | 25.91 | 26.56 | 29.47 |
| SiO2 | 51.46 | 50.16 | 51.27 | 52.01 | 50.09 | 52.23 | 37.22 | 56.81 | 55.80 | 51.91 |
| K2O | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.15 | 0.00 | 1.85 | 1.58 | 0.73 |
| CaO | 22.12 | 22.45 | 22.91 | 22.87 | 22.24 | 23.65 | 0.36 | 9.24 | 9.95 | 13.46 |
| TiO2 | 0.54 | 0.71 | 0.62 | 0.39 | 0.74 | 0.40 | 0.01 | 0.05 | 0.03 | 0.04 |
| MnO | 0.33 | 0.22 | 0.13 | 0.12 | 0.24 | 0.08 | 0.79 | 0.00 | 0.06 | 0.00 |
| FeOt | 8.37 | 8.28 | 5.49 | 5.61 | 8.60 | 4.62 | 27.85 | 0.73 | 0.68 | 0.72 |
| Total | 100.48 | 99.65 | 99.27 | 100.00 | 99.78 | 99.96 | 100.09 | 99.43 | 99.35 | 99.60 |

| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|
| Eruptive Unit | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| Label | AT8.1.4 | AT8.2.1 | AT8.2.2 | AT8.2.3 | AT8.2.4 | AT8.2.5 | AT8.3.1 | AT8.3.2 | AT8.3.3 | AT8.3.4 |
| | feld | feld | feld | feld | feld | feld | cpx | cpx | cpx | cpx |
| Na2O | 4.07 | 4.01 | 3.80 | 3.98 | 3.63 | 3.89 | 0.46 | 0.39 | 0.41 | 0.37 |
| MgO | 0.06 | 0.07 | 0.06 | 0.07 | 0.09 | 0.07 | 13.43 | 13.60 | 14.05 | 14.20 |
| Al2O3 | 28.25 | 27.81 | 28.51 | 28.16 | 28.99 | 28.38 | 3.37 | 3.52 | 2.97 | 3.15 |
| SiO2 | 54.51 | 53.85 | 53.76 | 53.84 | 53.30 | 53.74 | 51.48 | 50.62 | 51.40 | 51.74 |
| K2O | 1.15 | 1.04 | 1.02 | 1.06 | 0.90 | 1.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| CaO | 11.60 | 11.69 | 12.10 | 11.84 | 12.44 | 12.40 | 23.10 | 23.16 | 22.77 | 22.39 |
| TiO2 | 0.04 | 0.03 | 0.06 | 0.06 | 0.02 | 0.02 | 0.66 | 0.62 | 0.52 | 0.50 |
| MnO | 0.01 | 0.02 | 0.01 | 0.03 | 0.00 | 0.02 | 0.26 | 0.26 | 0.28 | 0.25 |
| FeOt | 0.66 | 0.63 | 0.73 | 0.63 | 0.75 | 0.67 | 8.94 | 8.62 | 8.40 | 8.18 |
| Total | 100.35 | 99.15 | 100.06 | 99.66 | 100.12 | 100.21 | 101.69 | 100.79 | 100.79 | 100.79 |
| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| Eruptive Unit | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| Label | AT8.3.5 | AT8.3.6 | AT8.3.7 | AT8.4.1 | AT8.4.2 | AT8.4.3 | AT8.5.1 | AT8.5.2 | AT8.5.3 | AT8.5.4 |
| | cpx | cpx | cpx | cpx | cpx | cpx | feld | feld | feld | feld |
| Na2O | 0.43 | 0.25 | 0.37 | 0.19 | 0.28 | 0.36 | 3.83 | 4.31 | 4.08 | 3.79 |
| MgO | 13.57 | 15.55 | 13.97 | 16.09 | 15.57 | 14.97 | 0.05 | 0.06 | 0.05 | 0.08 |
| Al2O3 | 3.43 | 3.22 | 4.36 | 2.46 | 2.89 | 3.14 | 29.01 | 28.15 | 28.24 | 28.14 |
| SiO2 | 50.86 | 51.50 | 49.78 | 52.93 | 52.40 | 51.81 | 53.67 | 54.82 | 54.41 | 53.80 |
| K2O | 0.01 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 1.03 | 1.26 | 1.15 | 1.04 |
| CaO | 22.55 | 23.07 | 22.81 | 24.26 | 23.83 | 23.17 | 11.80 | 11.16 | 11.25 | 11.11 |
| TiO2 | 0.62 | 0.56 | 0.71 | 0.37 | 0.52 | 0.52 | 0.04 | 0.04 | 0.02 | 0.06 |
| MnO | 0.28 | 0.12 | 0.17 | 0.06 | 0.08 | 0.12 | 0.02 | 0.01 | 0.01 | 0.00 |
| FeOt | 8.82 | 5.16 | 8.08 | 5.02 | 4.99 | 6.40 | 0.65 | 0.63 | 0.67 | 0.77 |
| Total | 100.57 | 99.43 | 100.30 | 101.38 | 100.55 | 100.51 | 100.09 | 100.43 | 99.90 | 98.79 |
| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| Eruptive Unit | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| Label | AT8.6.1 | AT8.6.2 | AT8.6.3 | AT8.6.4 | AT8.6.5 | AT8.6.6 | AT8.6.7 | AT8.7.1 | AT8.7.2 | AT8.7.3 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| Na2O | 0.42 | 0.48 | 0.46 | 0.47 | 0.45 | 0.29 | 0.47 | 0.48 | 0.40 | 0.40 |
| MgO | 13.86 | 13.22 | 13.50 | 13.49 | 13.55 | 15.06 | 13.17 | 13.47 | 13.65 | 13.91 |
| Al2O3 | 3.23 | 3.96 | 3.37 | 3.63 | 3.25 | 2.51 | 4.19 | 3.75 | 3.26 | 2.54 |
| SiO2 | 51.34 | 50.48 | 51.28 | 51.17 | 51.16 | 52.71 | 50.04 | 50.33 | 50.84 | 51.75 |
| K2O | 0.00 | 0.02 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 |
| CaO | 21.50 | 22.31 | 21.88 | 22.45 | 22.72 | 22.88 | 22.44 | 22.47 | 21.80 | 22.20 |
| TiO2 | 0.56 | 0.69 | 0.60 | 0.62 | 0.57 | 0.45 | 0.74 | 0.66 | 0.55 | 0.45 |
| MnO | 0.31 | 0.25 | 0.22 | 0.32 | 0.28 | 0.22 | 0.28 | 0.23 | 0.28 | 0.30 |
| FeOt | 8.95 | 9.06 | 8.87 | 9.04 | 8.61 | 6.98 | 9.25 | 9.10 | 9.05 | 8.98 |
| Total | 100.18 | 100.48 | 100.18 | 101.20 | 100.62 | 101.11 | 100.57 | 100.52 | 99.83 | 100.53 |
| Date Analysed | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| Eruptive Unit | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| Label | AT8.7.4 | AT8.7.5 | AT6.1.2 | AT6.1.3 | AT6.1.4 | AT6.2.1 | AT6.2.2 | AT6.2.3 | AT6.2.4 | AT6.2.5 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | ol | ol |
| Na2O | 0.45 | 0.57 | 0.46 | 0.46 | 0.42 | 0.47 | 0.46 | 0.44 | 0.02 | 0.00 |
| MgO | 13.78 | 13.60 | 13.40 | 13.34 | 13.53 | 14.48 | 13.65 | 13.90 | 34.71 | 34.60 |
| Al2O3 | 3.29 | 3.55 | 3.74 | 3.85 | 3.75 | 2.08 | 3.60 | 3.27 | 0.03 | 0.04 |
| SiO2 | 50.98 | 50.86 | 50.40 | 49.97 | 50.25 | 52.53 | 50.76 | 50.12 | 37.52 | 37.57 |
| K2O | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| CaO | 22.74 | 22.04 | 22.98 | 22.48 | 23.10 | 20.19 | 23.27 | 22.80 | 0.33 | 0.36 |
| TiO2 | 0.56 | 0.63 | 0.71 | 0.76 | 0.70 | 0.42 | 0.62 | 0.62 | 0.03 | 0.02 |
| MnO | 0.34 | 0.23 | 0.25 | 0.16 | 0.20 | 0.27 | 0.21 | 0.21 | 0.70 | 0.73 |
| FeOt | 8.93 | 8.79 | 9.37 | 9.04 | 8.59 | 9.98 | 9.11 | 8.79 | 28.19 | 27.89 |
| Total | 101.07 | 100.29 | 101.32 | 100.06 | 100.55 | 100.42 | 101.68 | 100.16 | 101.53 | 101.22 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| **Label** | AT6.3.1 | AT6.3.2 | AT6.3.3 | AT6.3.4 | AT6.3.5 | AT6.4.1 | AT6.4.2 | AT6.4.3 | AT6.4.4 | AT6.5.1 |
| | feld | feld | feld | feld | feld | cpx | cpx | cpx | feld | feld |
| **Na2O** | 4.38 | 3.85 | 4.39 | 4.42 | 4.68 | 0.49 | 0.45 | 0.44 | 3.74 | 4.11 |
| **MgO** | 0.06 | 1.65 | 0.07 | 0.08 | 0.08 | 13.47 | 13.73 | 14.17 | 1.98 | 0.07 |
| **Al2O3** | 27.20 | 18.37 | 26.38 | 27.77 | 27.08 | 3.60 | 3.35 | 3.15 | 18.00 | 28.23 |
| **SiO2** | 55.59 | 57.06 | 54.11 | 54.75 | 55.98 | 51.18 | 51.21 | 51.56 | 56.08 | 54.38 |
| **K2O** | 1.46 | 6.63 | 1.46 | 1.33 | 1.60 | 0.00 | 0.01 | 0.00 | 6.27 | 1.10 |
| **CaO** | 10.47 | 3.69 | 10.39 | 10.93 | 10.18 | 22.51 | 21.63 | 21.48 | 4.63 | 11.58 |
| **TiO2** | 0.05 | 0.60 | 0.04 | 0.05 | 0.05 | 0.67 | 0.55 | 0.54 | 0.64 | 0.04 |
| **MnO** | 0.00 | 0.12 | 0.00 | 0.03 | 0.01 | 0.19 | 0.28 | 0.34 | 0.14 | 0.01 |
| **FeOt** | 0.68 | 6.17 | 0.66 | 0.67 | 0.61 | 9.09 | 9.21 | 8.78 | 6.80 | 0.70 |
| **Total** | 99.88 | 98.13 | 97.50 | 100.03 | 100.28 | 101.20 | 100.43 | 100.47 | 98.28 | 100.22 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 |
| **Eruptive Unit** | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| **Label** | AT6.5.2 | AT6.5.3 | AT6.5.4 | AT6.5.5 | AT6.6.1 | AT6.6.2 | AT6.6.3 | AT6.6.4 | AT6.6.5 | AT6.7.1 |
| | feld | feld | feld | feld | feld | feld | feld | feld | feld | cpx |
| **Na2O** | 4.37 | 4.25 | 4.27 | 4.20 | 4.27 | 4.64 | 4.18 | 4.32 | 4.57 | 0.43 |
| **MgO** | 0.06 | 0.07 | 0.05 | 0.07 | 0.05 | 0.05 | 0.07 | 0.07 | 0.06 | 13.67 |
| **Al2O3** | 27.50 | 27.48 | 27.65 | 27.73 | 27.17 | 26.32 | 27.65 | 27.88 | 27.06 | 3.18 |
| **SiO2** | 55.59 | 55.45 | 54.32 | 54.30 | 55.67 | 56.20 | 54.63 | 54.84 | 56.08 | 51.78 |
| **K2O** | 1.40 | 1.30 | 1.16 | 1.22 | 1.43 | 1.63 | 1.14 | 1.23 | 1.61 | 0.00 |
| **CaO** | 10.66 | 9.98 | 11.35 | 10.68 | 10.40 | 9.81 | 11.45 | 11.23 | 9.93 | 21.15 |
| **TiO2** | 0.03 | 0.02 | 0.03 | 0.04 | 0.04 | 0.02 | 0.04 | 0.04 | 0.04 | 0.58 |
| **MnO** | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.25 |
| **FeOt** | 0.62 | 0.62 | 0.66 | 0.72 | 0.53 | 0.62 | 0.59 | 0.63 | 0.60 | 8.58 |
| **Total** | 100.23 | 99.18 | 99.48 | 98.95 | 99.57 | 99.29 | 99.75 | 100.25 | 99.95 | 99.62 |
| **Date Analysed** | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
| **Eruptive Unit** | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| **Label** | AT6.7.2 | AT6.7.3 | AT6.8.1 | AT6.8.2 | AT6.8.3 | AT7.11.1.m1 | AT7.11.1.m2 | AT7.11.1.m3 | AT7.11.2.m2 | AT7.12.1 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | ol | cpx |
| **Na2O** | 0.47 | 0.46 | 0.53 | 0.47 | 0.46 | 0.47 | 0.44 | 0.46 | 0.00 | 0.42 |
| **MgO** | 13.29 | 13.40 | 13.37 | 13.65 | 13.57 | 13.32 | 13.75 | 12.77 | 34.65 | 14.09 |
| **Al2O3** | 3.76 | 3.69 | 3.74 | 3.56 | 3.79 | 4.40 | 4.19 | 5.19 | 0.00 | 3.16 |
| **SiO2** | 50.41 | 50.66 | 50.95 | 50.96 | 50.41 | 48.74 | 48.81 | 46.57 | 35.90 | 48.19 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **CaO** | 22.08 | 22.58 | 22.70 | 22.49 | 23.28 | 21.79 | 21.90 | 21.87 | 0.46 | 21.77 |
| **TiO2** | 0.77 | 0.65 | 0.66 | 0.62 | 0.69 | 0.73 | 0.76 | 1.00 | 0.02 | 0.57 |
| **MnO** | 0.27 | 0.27 | 0.24 | 0.24 | 0.27 | 0.22 | 0.22 | 0.25 | 0.70 | 0.20 |
| **FeOt** | 9.07 | 9.19 | 9.06 | 8.88 | 9.20 | 9.01 | 8.58 | 9.14 | 27.80 | 7.89 |
| **Total** | 100.13 | 100.90 | 101.27 | 100.87 | 101.68 | 98.69 | 98.64 | 97.25 | 99.53 | 96.29 |
| **Date Analysed** | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
| **Eruptive Unit** | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| **Label** | AT7.12.2 | AT7.12.3 | AT7.13.3 | AT7.3.1.m1 | AT7.3.1.m2 | AT7.3.1.m3 | AT7.3.2.m1 | AT7.3.2.m2 | AT7.3.3.m1 | AT7.4.1.m1 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.46 | 0.43 | 0.43 | 0.47 | 0.47 | 0.34 | 0.34 | 0.34 | 0.50 | 0.45 |
| **MgO** | 13.67 | 13.99 | 13.95 | 13.60 | 13.62 | 14.72 | 14.38 | 13.87 | 13.33 | 13.74 |
| **Al2O3** | 3.37 | 3.68 | 3.68 | 3.55 | 4.29 | 2.89 | 2.86 | 3.80 | 3.74 | 3.11 |
| **SiO2** | 48.27 | 49.67 | 48.11 | 50.04 | 48.90 | 50.98 | 50.72 | 49.83 | 49.40 | 50.17 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 |
| **CaO** | 21.32 | 21.80 | 21.25 | 21.61 | 21.92 | 22.02 | 21.75 | 22.24 | 21.58 | 21.79 |
| **TiO2** | 0.60 | 0.63 | 0.61 | 0.61 | 0.76 | 0.46 | 0.46 | 0.51 | 0.66 | 0.58 |
| **MnO** | 0.31 | 0.27 | 0.26 | 0.27 | 0.23 | 0.17 | 0.20 | 0.15 | 0.27 | 0.26 |
| **FeOt** | 8.30 | 8.33 | 8.04 | 8.70 | 8.42 | 7.00 | 7.61 | 7.73 | 8.87 | 8.64 |
| **Total** | 96.30 | 98.81 | 96.33 | 98.85 | 98.62 | 98.57 | 98.33 | 98.47 | 98.36 | 98.75 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Date Analysed** | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 |
| **Eruptive Unit** | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| **Label** | AT7.4.1.m2 | AT7.5.1.m1 | AT7.5.1.m2 | AT7.5.1.m3 | AT7.6.1.m1 | AT7.6.1.m2 | AT7.6.2.m1 | AT7.6.2.m2 | AT7.6.2.m3 | AT7.8.1.m1 |
| | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.29 | 0.43 | 0.46 | 0.45 | 0.45 | 0.42 | 0.44 | 0.37 | 0.43 | 0.23 |
| **MgO** | 15.25 | 14.04 | 14.02 | 13.56 | 13.41 | 13.73 | 13.81 | 13.88 | 13.68 | 16.00 |
| **Al2O3** | 2.81 | 3.12 | 3.16 | 3.73 | 3.69 | 3.76 | 3.77 | 4.23 | 3.70 | 2.20 |
| **SiO2** | 51.12 | 50.06 | 50.16 | 49.47 | 49.82 | 49.67 | 48.46 | 48.58 | 49.13 | 50.90 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| **CaO** | 22.70 | 21.66 | 21.41 | 21.56 | 21.72 | 22.04 | 21.14 | 21.92 | 21.67 | 22.36 |
| **TiO2** | 0.45 | 0.59 | 0.50 | 0.67 | 0.69 | 0.72 | 0.56 | 0.64 | 0.61 | 0.29 |
| **MnO** | 0.10 | 0.27 | 0.29 | 0.29 | 0.28 | 0.20 | 0.22 | 0.19 | 0.24 | 0.12 |
| **FeOt** | 6.08 | 8.76 | 8.64 | 8.98 | 8.32 | 8.24 | 7.61 | 7.80 | 8.33 | 4.22 |
| **Total** | 98.80 | 98.94 | 98.64 | 98.70 | 98.39 | 98.79 | 96.01 | 97.61 | 97.78 | 96.33 |
| **Date Analysed** | 10.10.21 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 |
| **Eruptive Unit** | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| **Label** | AT7.8.1.m2 | AT4.1-c1-m | AT4.1-c1-m | AT4.1-c1-m | AT4.1-c1-r1 | AT4.1-c4-m | AT4.1-c4-m | AT4.1-c4-m | AT4.1-c4-r1 | AT4.1-c4-r2 |
| | cpx | cpx | cpx | cpx | feld | cpx | cpx | cpx | feld | feld |
| **Na2O** | 0.21 | 0.47 | 0.41 | 0.50 | 3.28 | 0.44 | 0.41 | 0.44 | 2.94 | 3.36 |
| **MgO** | 16.55 | 13.62 | 13.50 | 13.39 | 2.62 | 13.56 | 13.59 | 13.66 | 2.63 | 2.67 |
| **Al2O3** | 1.44 | 3.38 | 3.73 | 3.73 | 17.44 | 3.96 | 3.71 | 3.73 | 17.50 | 17.00 |
| **SiO2** | 51.80 | 50.38 | 50.28 | 50.00 | 54.04 | 50.16 | 50.02 | 50.39 | 53.50 | 53.05 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.01 | 6.52 | 0.00 | 0.00 | 0.00 | 6.40 | 6.74 |
| **CaO** | 22.28 | 21.89 | 22.12 | 22.12 | 5.72 | 22.10 | 22.15 | 22.22 | 5.58 | 5.65 |
| **TiO2** | 0.25 | 0.64 | 0.71 | 0.77 | 0.71 | 0.68 | 0.64 | 0.69 | 0.69 | 0.74 |
| **MnO** | 0.10 | 0.32 | 0.22 | 0.20 | 0.14 | 0.25 | 0.25 | 0.21 | 0.16 | 0.14 |
| **FeOt** | 4.13 | 8.73 | 8.46 | 8.64 | 7.32 | 8.63 | 8.68 | 8.60 | 7.38 | 7.80 |
| **Total** | 96.77 | 99.42 | 99.43 | 99.34 | 97.78 | 99.79 | 99.46 | 99.93 | 96.78 | 97.15 |
| **Date Analysed** | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 |
| **Eruptive Unit** | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| **Label** | AT4.2-c1-m | AT4.2-c1-m | AT4.2-c1-m | AT4.2-c2-r1 | AT4.2-c2-r2 | AT4.2-c2-m | AT4.2-c2-m | AT4.3-c1-m | AT4.3-c1-m | AT4.3-c1-m |
| | cpx | cpx | cpx | feld | feld | cpx | cpx | cpx | cpx | cpx |
| **Na2O** | 0.39 | 0.45 | 0.43 | 3.13 | 3.03 | 0.47 | 0.41 | 0.43 | 0.40 | 0.48 |
| **MgO** | 13.24 | 13.48 | 13.40 | 2.49 | 2.57 | 13.34 | 13.39 | 13.68 | 13.57 | 13.57 |
| **Al2O3** | 3.60 | 3.77 | 3.66 | 18.23 | 17.40 | 4.05 | 3.98 | 3.83 | 3.96 | 4.44 |
| **SiO2** | 50.47 | 50.64 | 50.41 | 52.73 | 53.98 | 49.68 | 49.90 | 49.51 | 48.39 | 48.25 |
| **K2O** | 0.00 | 0.00 | 0.01 | 6.03 | 5.91 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 |
| **CaO** | 22.35 | 22.20 | 22.09 | 5.40 | 5.51 | 22.00 | 22.14 | 22.36 | 22.20 | 22.09 |
| **TiO2** | 0.68 | 0.67 | 0.69 | 0.71 | 0.69 | 0.76 | 0.81 | 0.64 | 0.69 | 0.68 |
| **MnO** | 0.19 | 0.22 | 0.29 | 0.14 | 0.16 | 0.24 | 0.23 | 0.26 | 0.22 | 0.16 |
| **FeOt** | 8.47 | 8.52 | 8.69 | 7.50 | 7.52 | 8.68 | 8.86 | 8.46 | 8.69 | 8.88 |
| **Total** | 99.40 | 99.95 | 99.66 | 96.35 | 96.75 | 99.23 | 99.72 | 99.17 | 98.13 | 98.57 |
| **Date Analysed** | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 |
| **Eruptive Unit** | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 | Vulcanello1 |
| **Label** | AT4.3-c3-r1 | AT4.3-c4-r1 | AT4.3-c4-r2 | AT4.3-c4-r3 | AT4.4-c1-r1 | AT4.4-c2-r1 | AT4.4-c2-m | AT4.4-c3-r2 | AT4.4-c3-r3 | AT4.4-c5-m1 |
| | feld | cpx | cpx | cpx | feld | cpx | cpx | feld | feld | cpx |
| **Na2O** | 3.08 | 0.39 | 0.42 | 0.45 | 3.20 | 0.30 | 0.40 | 2.85 | 1.50 | 0.44 |
| **MgO** | 1.70 | 13.74 | 13.47 | 13.10 | 2.46 | 15.75 | 13.79 | 1.95 | 1.72 | 13.95 |
| **Al2O3** | 18.61 | 3.16 | 3.75 | 4.15 | 17.72 | 2.03 | 3.30 | 16.80 | 17.65 | 3.17 |
| **SiO2** | 55.82 | 50.51 | 50.27 | 50.05 | 53.74 | 52.29 | 50.34 | 54.33 | 55.57 | 51.12 |
| **K2O** | 7.02 | 0.00 | 0.00 | 0.00 | 6.09 | 0.03 | 0.01 | 6.46 | 5.51 | 0.00 |
| **CaO** | 4.25 | 22.03 | 22.02 | 22.33 | 5.45 | 23.09 | 21.93 | 5.47 | 5.41 | 21.89 |
| **TiO2** | 0.64 | 0.61 | 0.63 | 0.79 | 0.71 | 0.36 | 0.61 | 1.24 | 1.21 | 0.64 |
| **MnO** | 0.21 | 0.28 | 0.26 | 0.24 | 0.11 | 0.17 | 0.29 | 0.12 | 0.16 | 0.25 |
| **FeOt** | 6.08 | 8.24 | 8.77 | 8.91 | 7.53 | 6.09 | 8.68 | 7.21 | 7.23 | 8.68 |
| **Total** | 97.42 | 98.96 | 99.60 | 100.02 | 97.01 | 100.12 | 99.36 | 96.43 | 95.97 | 100.15 |

Table G2: List of data produced through EMPA at Oxford for all the phenocrysts (including the zoned cpx phenocrysts) found in deposits from Vulcanello

| **Date Analysed** | Plagioclase Standard | | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 | 10.06.23 | 10.06.23 | 10.06.23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | USNM 115900 | +/- | plg-USNM_2 | plg-USNM_1 | plg-USNM_4 | plg-USNM_6 | plg-USNM_7 | plg-USNM_5 | plg-USNM_3 | Plag_1 | Plag_2 | Plag_4 |
| **Na2O** | 3.58 | 0.08 | 3.65 | 3.54 | 3.59 | 3.64 | 3.57 | 3.69 | 3.71 | 3.47 | 3.46 | 3.49 |
| **MgO** | 0.15 | 0.01 | 0.13 | 0.14 | 0.14 | 0.16 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 |
| **Al2O3** | 30.98 | 0.17 | 29.97 | 29.76 | 30.17 | 29.93 | 30.24 | 29.83 | 29.72 | 30.34 | 30.96 | 29.93 |
| **SiO2** | 51.53 | 0.24 | 51.39 | 51.37 | 51.34 | 51.76 | 51.91 | 51.35 | 51.06 | 51.81 | 52.43 | 52.18 |
| **K2O** | 0.12 | 0.01 | 0.13 | 0.12 | 0.13 | 0.12 | 0.12 | 0.11 | 0.13 | 0.11 | 0.11 | 0.11 |
| **CaO** | 13.33 | 0.11 | 13.82 | 13.75 | 13.65 | 13.63 | 13.59 | 13.42 | 13.86 | 14.13 | 13.37 | 14.14 |
| **TiO2** | | | 0.05 | 0.04 | 0.05 | 0.05 | 0.07 | 0.05 | 0.05 | 0.04 | 0.07 | 0.05 |
| **MnO** | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.02 | 0.00 | 0.01 |
| **FeOt** | 0.41 | 0.04 | 0.54 | 0.41 | 0.38 | 0.38 | 0.48 | 0.45 | 0.42 | 0.42 | 0.48 | 0.42 |
| **Total** | 100.09 | 0.26 | 99.68 | 99.14 | 99.45 | 99.68 | 100.13 | 99.06 | 99.14 | 100.50 | 101.04 | 100.49 |

| **Date Analysed** | 10.06.23 | 10.06.23 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | Plag_5 | Plag_6 | plag_2 | plag_3 | plag_4 | plag_1 | plag_2 | plag_3 | plag_1 | plag_2 | plag_3 | plag_4 |
| **Na2O** | 3.42 | 3.40 | 3.85 | 3.83 | 3.90 | 3.90 | 3.91 | 3.19 | 3.96 | 3.94 | 3.78 | 3.84 |
| **MgO** | 0.14 | 0.15 | 0.15 | 0.14 | 0.13 | 0.12 | 0.14 | 0.13 | 0.14 | 0.13 | 0.14 | 0.13 |
| **Al2O3** | 30.16 | 29.97 | 30.77 | 30.86 | 30.76 | 30.48 | 30.74 | 30.65 | 30.40 | 30.39 | 30.26 | 30.51 |
| **SiO2** | 51.64 | 51.85 | 51.74 | 51.85 | 51.29 | 51.33 | 51.81 | 51.92 | 50.98 | 51.04 | 50.92 | 51.37 |
| **K2O** | 0.11 | 0.10 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.12 | 0.12 | 0.12 | 0.11 | 0.12 |
| **CaO** | 13.86 | 13.59 | 13.31 | 13.47 | 13.45 | 13.52 | 13.29 | 13.45 | 13.61 | 13.61 | 13.33 | 13.56 |
| **TiO2** | 0.04 | 0.04 | 0.04 | 0.04 | 0.03 | 0.05 | 0.05 | 0.04 | 0.04 | 0.03 | 0.03 | 0.05 |
| **MnO** | 0.00 | 0.00 | 0.02 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 |
| **FeOt** | 0.45 | 0.48 | 0.37 | 0.37 | 0.41 | 0.39 | 0.36 | 0.40 | 0.44 | 0.42 | 0.42 | 0.52 |
| **Total** | 99.82 | 99.59 | 100.37 | 100.71 | 100.12 | 99.93 | 100.44 | 99.90 | 99.72 | 99.70 | 99.00 | 100.11 |

| **Date Analysed** | 10.08.23 | 10.08.23 | 10.10.21 | 10.10.21 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 09.11.30 | 09.11.30 | 09.11.30 | 09.11.30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | plag_5 | plag_6 | plag1 | plag2 | plag_1 | plag_2 | plag_3 | plag_4 | pyr-USNM_2 | pyr-USNM_1 | pyr-USNM_7 | pyr-USNM_4 |
| **Na2O** | 3.77 | 3.84 | 3.47 | 3.48 | 3.59 | 3.72 | 3.65 | 3.68 | 0.01 | 0.01 | 0.01 | 0.01 |
| **MgO** | 0.13 | 0.16 | 0.16 | 0.16 | 0.14 | 0.14 | 0.13 | 0.14 | 18.65 | 18.82 | 18.90 | 18.86 |
| **Al2O3** | 30.53 | 30.77 | 31.15 | 31.07 | 30.21 | 30.11 | 30.67 | 30.18 | 23.33 | 24.04 | 23.89 | 23.83 |
| **SiO2** | 51.37 | 51.68 | 51.61 | 51.44 | 51.61 | 51.49 | 51.44 | 51.35 | 41.48 | 42.05 | 41.65 | 41.85 |
| **K2O** | 0.11 | 0.13 | 0.12 | 0.12 | 0.13 | 0.15 | 0.13 | 0.13 | 0.00 | 0.01 | 0.00 | 0.00 |
| **CaO** | 13.55 | 13.55 | 13.88 | 13.79 | 13.73 | 13.83 | 13.69 | 13.66 | 5.13 | 5.14 | 5.18 | 5.08 |
| **TiO2** | 0.03 | 0.05 | 0.02 | 0.02 | 0.03 | 0.05 | 0.03 | 0.05 | 0.44 | 0.42 | 0.44 | 0.42 |
| **MnO** | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.02 | 0.35 | 0.27 | 0.29 | 0.35 |
| **FeOt** | 0.43 | 0.40 | 0.41 | 0.41 | 0.44 | 0.38 | 0.42 | 0.42 | 10.58 | 10.73 | 10.62 | 10.75 |
| **Total** | 99.97 | 100.59 | 100.83 | 100.49 | 99.88 | 99.90 | 100.19 | 99.64 | 99.97 | 101.49 | 100.98 | 101.16 |

| **Date Analysed** | 09.11.30 | 09.11.30 | 09.11.30 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.06.23 | 10.08.19 | 10.08.19 | 10.08.19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | pyr-USNM_5 | pyr-USNM_3 | pyr-USNM_6 | Pyrope_1 | Pyrope_2 | Pyrope_3 | Pyrope_4 | Pyrope_5 | Pyrope_6 | pyrope_5 | pyrope_6 | pyrope_7 |
| **Na2O** | 0.02 | 0.03 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.03 | 0.01 | 0.03 | 0.05 | 0.03 |
| **MgO** | 18.86 | 18.78 | 18.44 | 18.04 | 18.12 | 18.05 | 18.23 | 18.16 | 18.11 | 18.72 | 18.15 | 18.07 |
| **Al2O3** | 24.05 | 24.06 | 23.79 | 23.80 | 23.57 | 23.77 | 23.67 | 23.74 | 23.82 | 23.79 | 23.60 | 23.72 |
| **SiO2** | 41.85 | 41.90 | 41.62 | 42.41 | 42.36 | 42.28 | 42.40 | 42.61 | 42.44 | 42.01 | 41.54 | 41.71 |
| **K2O** | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.00 | 0.01 | 0.00 |
| **CaO** | 5.13 | 5.10 | 5.01 | 5.35 | 5.39 | 5.31 | 5.09 | 5.01 | 5.41 | 5.14 | 5.10 | 5.05 |
| **TiO2** | 0.43 | 0.43 | 0.48 | 0.44 | 0.45 | 0.44 | 0.44 | 0.46 | 0.42 | 0.44 | 0.44 | 0.40 |
| **MnO** | 0.34 | 0.29 | 0.32 | 0.35 | 0.34 | 0.34 | 0.34 | 0.27 | 0.30 | 0.31 | 0.29 | 0.30 |
| **FeOt** | 10.37 | 10.46 | 10.47 | 10.48 | 10.75 | 10.48 | 10.48 | 10.61 | 10.62 | 10.24 | 10.55 | 10.55 |
| **Total** | 101.05 | 101.06 | 100.15 | 100.89 | 101.00 | 100.70 | 100.68 | 100.90 | 101.13 | 100.68 | 99.72 | 99.82 |

| Date Analysed | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.19 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 | 10.08.23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | pyrope_8 | pyrope_2 | pyrope_3 | pyrope_4 | pyrope_7 | pyrope_8 | pyrope_1 | pyrope_2 | pyrope_3 | pyrope_4 | pyrope_5 | pyrope_6 |
| **Na2O** | 0.03 | 0.01 | 0.03 | 0.02 | 0.05 | 0.04 | 0.02 | 0.04 | 0.03 | 0.00 | 0.02 | 0.03 |
| **MgO** | 18.21 | 18.24 | 18.51 | 18.15 | 18.41 | 18.26 | 18.40 | 18.10 | 18.52 | 18.64 | 18.46 | 18.66 |
| **Al2O3** | 23.68 | 23.66 | 23.74 | 23.76 | 23.77 | 23.71 | 23.74 | 23.72 | 23.60 | 23.71 | 23.75 | 23.72 |
| **SiO2** | 41.76 | 41.54 | 42.00 | 41.91 | 41.59 | 41.67 | 41.60 | 41.52 | 41.57 | 41.77 | 41.78 | 41.87 |
| **K2O** | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **CaO** | 5.06 | 5.13 | 5.07 | 5.13 | 5.17 | 5.12 | 5.15 | 5.10 | 5.11 | 5.13 | 5.14 | 5.15 |
| **TiO2** | 0.41 | 0.41 | 0.41 | 0.44 | 0.43 | 0.41 | 0.46 | 0.43 | 0.42 | 0.43 | 0.46 | 0.40 |
| **MnO** | 0.36 | 0.31 | 0.31 | 0.34 | 0.32 | 0.35 | 0.37 | 0.31 | 0.38 | 0.31 | 0.36 | 0.32 |
| **FeOt** | 10.21 | 10.62 | 10.46 | 10.54 | 10.66 | 10.55 | 10.79 | 10.31 | 10.63 | 10.42 | 10.39 | 10.66 |
| **Total** | 99.73 | 99.92 | 100.54 | 100.29 | 100.40 | 100.11 | 100.52 | 99.52 | 100.26 | 100.41 | 100.36 | 100.82 |

| Date Analysed | 10.08.23 | 10.08.23 | 10.10.21 | 10.10.21 | 10.10.21 | 10.10.21 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 | 10.11.24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Label** | pyrope_7 | pyrope_8 | pyrope1 | pyrope2 | pyrope3 | pyrope4 | pyrope_1 | pyrope_2 | pyrope_3 | pyrope_4 | pyrope_5 | pyrope_6 |
| **Na2O** | 0.03 | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| **MgO** | 18.35 | 18.59 | 17.76 | 18.16 | 17.99 | 18.33 | 18.92 | 19.15 | 19.05 | 18.76 | 19.02 | 18.95 |
| **Al2O3** | 23.74 | 23.58 | 23.62 | 23.63 | 23.64 | 23.71 | 24.05 | 24.04 | 23.98 | 24.07 | 23.81 | 24.18 |
| **SiO2** | 41.65 | 41.73 | 41.92 | 41.73 | 41.87 | 41.71 | 41.89 | 41.82 | 41.82 | 41.77 | 41.78 | 41.77 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| **CaO** | 5.15 | 5.11 | 5.11 | 5.12 | 5.12 | 5.07 | 5.14 | 5.22 | 5.19 | 5.12 | 5.19 | 5.17 |
| **TiO2** | 0.43 | 0.43 | 0.44 | 0.46 | 0.40 | 0.41 | 0.41 | 0.40 | 0.43 | 0.42 | 0.40 | 0.39 |
| **MnO** | 0.33 | 0.28 | 0.31 | 0.36 | 0.32 | 0.33 | 0.31 | 0.30 | 0.29 | 0.32 | 0.29 | 0.33 |
| **FeOt** | 10.46 | 10.42 | 10.62 | 10.63 | 10.49 | 10.73 | 10.71 | 10.77 | 10.87 | 10.74 | 10.69 | 10.74 |
| **Total** | 100.14 | 100.16 | 99.81 | 100.10 | 99.86 | 100.30 | 101.45 | 101.72 | 101.65 | 101.22 | 101.19 | 101.57 |

Table G3: List of secondary standard data produced through EMPA at Oxford for all the phenocrysts

Laser Data for zoned cpx

- The LA-ICP-MS equipment was set up, tuned (using NIST SRM 612) and calibrated by either Dr. Emma Tomlinson or Dr. Christina Manning with secondary standards (atho and sths 6/80) used to check the precision and accuracy of the run.
- Tuning: 74µm; 5Hz; 1mm/min
- Gas Flow: 850ml/min He and 5ml/min $N_2$
- Acquisition: slit parallel to the crystal edge, slit dimensions: 50µm x 10µm
- 30 sec delay before and after to give the background values,
- scan speed: 0.1mm/min
- The internal standard used was $^{29}Si$ and the Si concentration of each shard had previously been determined though EMP analysis.
- Laser alignment was checked by test firing a single shot into the resin.
- Points for analysis were programmed into the laser and once all points were programmed, the microprobe was set running.
- The data was then reduced by subtracting the background signal from the data and then by calculating the concentration of the data for each time slice.
- The final Ca value for the sths6/80 standard was then compared to the published value and this was used to correct any bias in the run.

The LA-ICP-MS mineral transect data produced during this research is shown in the tables on the next 22 pages.

| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AT13.11.7track2 | | | | | | | | | | | | | | | | | | | | |
| 160468 | 104 | 137 | 2501 | 34 | 155 | 132 | 10.2 | 37.3 | 0.2 | 0.3 | 6.7 | 21.0 | 21.1 | 4.2 | 1.1 | 3.8 | 3.0 | 1.2 | 1.4 | <LOD |
| 154283 | 121 | 135 | 1657 | 36 | 125 | 143 | 10.9 | 34.8 | 0.2 | 0.1 | 7.0 | 20.9 | 18.3 | 5.6 | 1.3 | 5.1 | 2.4 | 1.2 | 0.4 | <LOD |
| 153882 | 126 | 127 | 2314 | 29 | 184 | 145 | 12.4 | 33.5 | 0.1 | 0.2 | 5.4 | 20.8 | 12.6 | 3.2 | 1.1 | 3.1 | 1.8 | 1.2 | 0.9 | 0.1 |
| 137363 | 109 | 109 | 3750 | 33 | 145 | 124 | 10.6 | 29.8 | 0.2 | 0.3 | 5.6 | 18.9 | 15.4 | 3.2 | 1.0 | 4.8 | 2.4 | 1.5 | 0.4 | <LOD |
| 150087 | 104 | 122 | 1870 | 32 | 117 | 135 | 9.5 | 32.2 | 0.2 | 0.3 | 5.7 | 20.0 | 19.7 | 4.1 | 0.9 | 3.5 | 2.2 | 1.1 | 1.3 | 0.1 |
| 146236 | 115 | 119 | 1991 | 32 | 126 | 129 | 10.5 | 25.7 | <LOD | 0.3 | 5.6 | 19.3 | 16.3 | 4.0 | 1.0 | 3.5 | 2.9 | 1.1 | 0.9 | 0.2 |
| 154322 | 120 | 144 | 2516 | 30 | 136 | 157 | 11.4 | 36.0 | 0.1 | 0.3 | 7.3 | 21.4 | 19.6 | 4.7 | 1.2 | 5.0 | 3.1 | 1.3 | 0.7 | <LOD |
| 166756 | 124 | 132 | 1995 | 34 | 173 | 143 | 10.7 | 33.6 | 0.2 | 0.2 | 6.5 | 22.6 | 17.1 | 5.0 | 1.1 | 4.1 | 3.8 | 0.8 | 1.4 | 0.1 |
| 158116 | 122 | 135 | 1637 | 28 | 152 | 141 | 11.1 | 40.0 | 0.2 | 0.3 | 8.2 | 22.0 | 19.8 | 6.1 | 0.7 | 5.5 | 3.1 | 1.5 | 1.1 | <LOD |
| 149459 | 126 | 140 | 1873 | 30 | 160 | 137 | 11.4 | 33.5 | 0.1 | 0.1 | 6.0 | 21.5 | 19.1 | 6.8 | 1.1 | 2.7 | 3.4 | 1.1 | 0.6 | 0.2 |
| 160990 | 141 | 119 | 2559 | 28 | 177 | 148 | 12.4 | 40.9 | 0.2 | 0.2 | 7.8 | 22.3 | 17.1 | 8.3 | 1.0 | 5.2 | 3.2 | 1.4 | 1.0 | 0.2 |
| 174366 | 129 | 140 | 1888 | 34 | 147 | 151 | 11.7 | 41.1 | 0.3 | 0.4 | 6.8 | 21.8 | 18.1 | 5.4 | 1.5 | 4.5 | 3.6 | 0.6 | 0.7 | <LOD |
| 160904 | 114 | 137 | 3104 | 32 | 114 | 133 | 13.0 | 33.7 | 0.2 | 0.3 | 5.9 | 22.8 | 24.2 | 5.2 | 1.4 | 4.2 | 4.1 | 1.1 | 1.6 | 0.1 |
| 150936 | 123 | 133 | 1973 | 34 | 140 | 136 | 12.8 | 38.4 | 0.1 | 0.2 | 6.6 | 23.2 | 21.0 | 6.5 | 1.0 | 4.0 | 3.4 | 1.2 | 0.6 | 0.3 |
| 149632 | 108 | 125 | 2358 | 36 | 144 | 139 | 13.3 | 36.2 | 0.1 | 0.3 | 7.4 | 24.4 | 19.3 | 7.3 | 1.6 | 4.9 | 2.8 | 0.8 | 2.2 | 0.1 |
| 142777 | 103 | 127 | 1823 | 36 | 109 | 135 | 15.4 | 36.1 | <LOD | 0.2 | 8.2 | 26.5 | 27.7 | 7.3 | 1.1 | 6.0 | 3.7 | 1.7 | 1.5 | 0.2 |
| 161676 | 114 | 137 | 2180 | 38 | 105 | 153 | 20.6 | 46.4 | 0.2 | 0.3 | 10.1 | 33.9 | 26.3 | 8.7 | 2.0 | 6.8 | 3.8 | 2.5 | 1.8 | 0.3 |
| 175311 | 103 | 173 | 1676 | 33 | 150 | 149 | 22.4 | 50.8 | 0.3 | 0.2 | 11.2 | 40.3 | 31.8 | 7.9 | 1.8 | 5.3 | 4.8 | 1.5 | 1.6 | 0.4 |
| 159298 | 98 | 203 | 1208 | 35 | 73 | 142 | 23.8 | 53.7 | 0.2 | 0.3 | 12.0 | 43.7 | 39.0 | 8.6 | 1.3 | 8.0 | 5.0 | 3.3 | 3.6 | 0.4 |
| 146535 | 89 | 186 | 945 | 39 | 83 | 142 | 27.6 | 58.6 | 0.3 | 0.3 | 14.2 | 48.0 | 36.6 | 10.0 | 1.7 | 7.1 | 3.9 | 3.6 | 2.8 | 0.5 |
| 159171 | 95 | 270 | 786 | 47 | 67 | 156 | 34.2 | 70.4 | 0.2 | 0.3 | 15.3 | 52.7 | 52.2 | 9.5 | 2.1 | 10.2 | 6.7 | 4.0 | 3.5 | 0.4 |
| 153657 | 87 | 248 | 521 | 42 | 60 | 151 | 34.9 | 68.6 | 0.2 | 0.4 | 17.8 | 56.6 | 43.1 | 13.3 | 2.0 | 10.0 | 9.3 | 3.7 | 3.0 | 0.5 |
| 153315 | 83 | 251 | 173 | 47 | 54 | 155 | 39.2 | 77.3 | 0.3 | 0.3 | 16.9 | 61.8 | 56.6 | 15.0 | 2.3 | 9.4 | 7.9 | 3.4 | 2.1 | 0.6 |
| 157770 | 89 | 248 | 128 | 47 | 38 | 152 | 36.9 | 69.9 | 0.2 | 0.4 | 19.3 | 61.3 | 55.0 | 11.4 | 2.2 | 10.3 | 9.9 | 4.5 | 3.4 | 0.6 |
| 146853 | 80 | 274 | 130 | 57 | 51 | 144 | 40.8 | 71.6 | 0.5 | 0.3 | 20.5 | 64.0 | 44.4 | 16.5 | 2.4 | 9.7 | 8.2 | 4.8 | 5.0 | 0.5 |
| 157914 | 81 | 293 | 108 | 47 | 46 | 161 | 42.7 | 76.2 | 0.3 | 0.5 | 18.7 | 63.6 | 49.2 | 13.1 | 2.0 | 10.2 | 8.7 | 3.3 | 3.2 | 0.6 |
| 168129 | 83 | 285 | 89 | 52 | 50 | 162 | 39.3 | 88.2 | 0.2 | 0.4 | 17.5 | 62.8 | 51.6 | 14.6 | 2.0 | 12.3 | 8.2 | 3.9 | 4.8 | 0.5 |
| 146029 | 79 | 318 | 56 | 52 | 48 | 152 | 42.3 | 81.8 | 0.4 | 0.3 | 18.3 | 64.1 | 50.3 | 14.2 | 2.1 | 9.4 | 9.7 | 3.3 | 3.5 | 0.6 |
| 146428 | 76 | 257 | 77 | 44 | 30 | 152 | 42.3 | 80.0 | 0.2 | 0.4 | 17.4 | 64.4 | 49.8 | 10.8 | 2.2 | 11.0 | 8.6 | 3.5 | 3.1 | 0.6 |
| 143624 | 76 | 278 | 53 | 53 | 39 | 153 | 37.0 | 81.0 | 0.3 | 0.3 | 18.7 | 68.4 | 44.6 | 11.7 | 2.7 | 11.3 | 9.9 | 3.2 | 4.5 | 0.5 |
| 144161 | 81 | 246 | 60 | 44 | 51 | 140 | 43.2 | 82.5 | 0.3 | 0.3 | 19.1 | 62.6 | 45.4 | 12.0 | 3.0 | 11.7 | 9.5 | 3.9 | 4.2 | 0.4 |
| 169663 | 88 | 290 | 44 | 52 | 48 | 156 | 39.4 | 86.7 | 0.2 | 0.3 | 17.6 | 70.1 | 49.7 | 10.3 | 2.7 | 11.5 | 8.0 | 6.2 | 3.7 | 0.7 |
| 149171 | 76 | 270 | 48 | 43 | 42 | 140 | 38.5 | 83.7 | 0.3 | 0.3 | 18.2 | 67.1 | 47.4 | 13.2 | 2.0 | 8.1 | 9.7 | 4.7 | 3.2 | 0.6 |
| 145228 | 83 | 314 | 45 | 53 | 49 | 132 | 41.9 | 80.9 | 0.4 | 0.5 | 21.2 | 63.8 | 48.6 | 13.6 | 2.4 | 11.6 | 8.3 | 4.9 | 4.6 | 0.8 |
| 155883 | 89 | 262 | 27 | 52 | 42 | 131 | 41.9 | 89.7 | 0.3 | 0.4 | 17.9 | 67.4 | 47.5 | 12.2 | 2.4 | 13.4 | 11.0 | 3.6 | 4.0 | 0.7 |
| 161455 | 88 | 288 | 72 | 50 | 44 | 137 | 45.6 | 92.6 | 0.3 | 0.3 | 21.9 | 70.3 | 55.1 | 16.5 | 2.9 | 13.0 | 7.0 | 4.8 | 4.3 | 0.6 |
| AT13.11.7track2 | | | | | | | | | | | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 155726 | 83 | 312 | 39 | 49 | 42 | 139 | 41.3 | 94.5 | 0.4 | 0.3 | 18.0 | 72.7 | 62.9 | 13.8 | 2.6 | 10.3 | 9.0 | 3.6 | 3.3 | 0.8 |
| 158891 | 80 | 322 | 30 | 42 | 51 | 135 | 42.6 | 98.0 | 0.4 | 0.4 | 21.2 | 70.4 | 57.3 | 13.5 | 2.8 | 10.5 | 9.1 | 4.9 | 3.9 | 0.6 |
| 137410 | 89 | 274 | 38 | 43 | 48 | 122 | 42.0 | 86.9 | 0.3 | 0.3 | 20.7 | 67.3 | 54.1 | 11.6 | 1.8 | 10.5 | 8.9 | 3.9 | 4.1 | 0.3 |
| 150700 | 85 | 347 | 25 | 48 | 42 | 131 | 39.9 | 93.7 | 0.3 | 0.2 | 22.2 | 70.5 | 53.5 | 14.3 | 2.5 | 11.8 | 9.1 | 4.1 | 5.2 | 0.7 |
| 168416 | 85 | 324 | 30 | 48 | 55 | 145 | 46.1 | 96.3 | 0.4 | 0.3 | 24.7 | 75.6 | 55.6 | 14.4 | 3.0 | 13.9 | 9.4 | 5.6 | 3.3 | 0.6 |
| 166127 | 96 | 358 | 33 | 50 | 49 | 137 | 49.3 | 104.7 | 0.4 | 0.4 | 21.2 | 72.9 | 51.2 | 18.1 | 2.2 | 11.2 | 11.7 | 3.9 | 5.3 | 0.7 |
| 155268 | 76 | 322 | 38 | 52 | 39 | 132 | 44.4 | 99.8 | 0.4 | 0.3 | 22.7 | 67.4 | 53.0 | 9.0 | 2.3 | 10.1 | 9.3 | 5.1 | 3.7 | 0.6 |
| 153312 | 80 | 269 | <LOD | 49 | 48 | 147 | 45.6 | 105.4 | 0.4 | 0.5 | 20.2 | 70.0 | 57.1 | 13.0 | 2.4 | 11.1 | 8.1 | 5.1 | 4.4 | 0.5 |
| 153959 | 91 | 315 | 22 | 47 | 57 | 145 | 45.1 | 110.7 | 0.4 | 0.5 | 22.2 | 72.1 | 68.1 | 13.1 | 1.8 | 13.2 | 10.0 | 4.8 | 4.0 | 0.6 |
| 143452 | 79 | 287 | <LOD | 43 | 33 | 144 | 45.6 | 111.1 | 0.4 | 0.3 | 19.0 | 69.7 | 52.1 | 14.9 | 2.5 | 10.3 | 9.3 | 4.3 | 3.8 | 0.6 |
| 155067 | 80 | 302 | <LOD | 47 | 30 | 143 | 48.1 | 101.4 | 0.3 | 0.3 | 20.6 | 68.7 | 55.2 | 15.9 | 2.6 | 11.1 | 8.2 | 5.7 | 4.6 | 0.6 |
| 141235 | 79 | 325 | <LOD | 53 | 27 | 135 | 44.7 | 99.4 | 0.3 | 0.5 | 19.4 | 69.1 | 48.1 | 12.9 | 3.2 | 13.6 | 8.8 | 5.7 | 3.9 | 0.5 |
| 148641 | 83 | 317 | <LOD | 53 | 38 | 147 | 48.3 | 103.2 | 0.7 | 0.3 | 23.2 | 69.4 | 49.1 | 11.9 | 2.7 | 10.9 | 9.1 | 4.6 | 4.6 | 0.5 |
| AT13.13.1track1 | | | | | | | | | | | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 143868 | 78 | 235 | 299 | 39 | 74 | 160 | 34.4 | 107.8 | 2.2 | 24.3 | 22.6 | 66.5 | 57.8 | 13.4 | 2.0 | 11.5 | 6.9 | 3.0 | 3.3 | 0.4 |
| 159089 | 90 | 237 | 197 | 41 | 67 | 234 | 42.6 | 106.9 | 1.6 | 16.7 | 21.8 | 75.3 | 54.4 | 13.4 | 2.0 | 13.3 | 9.5 | 4.7 | 3.1 | 0.7 |
| 135339 | 85 | 232 | 254 | 42 | 90 | 160 | 34.8 | 85.3 | 0.9 | 8.4 | 19.4 | 64.9 | 52.3 | 11.5 | 1.8 | 10.3 | 6.7 | 3.3 | 4.8 | 0.5 |
| 146788 | 94 | 228 | 358 | 51 | 72 | 166 | 41.8 | 89.2 | 0.7 | 4.2 | 18.9 | 68.3 | 51.1 | 14.4 | 2.0 | 11.2 | 8.2 | 4.6 | 2.9 | 0.7 |
| 134766 | 85 | 261 | 119 | 55 | 48 | 156 | 35.3 | 89.6 | 0.5 | 3.1 | 19.4 | 61.5 | 48.6 | 11.5 | 1.9 | 9.9 | 8.7 | 3.6 | 2.8 | 0.6 |
| 157654 | 83 | 265 | 117 | 49 | 62 | 151 | 39.0 | 76.0 | 0.4 | 1.9 | 18.2 | 63.4 | 45.0 | 12.2 | 1.9 | 11.5 | 7.9 | 3.9 | 4.8 | 0.5 |
| 149639 | 88 | 266 | 74 | 43 | 52 | 160 | 40.0 | 75.6 | 0.3 | 1.5 | 17.7 | 64.7 | 43.9 | 13.1 | 1.9 | 13.1 | 7.9 | 4.6 | 4.3 | 0.7 |
| 157109 | 86 | 253 | 47 | 58 | 81 | 151 | 38.7 | 74.5 | 0.4 | 1.1 | 19.7 | 65.7 | 49.6 | 10.4 | 2.8 | 11.1 | 7.4 | 3.9 | 4.8 | 0.4 |
| 159604 | 81 | 280 | 24 | 48 | 63 | 144 | 42.5 | 83.8 | 0.3 | 1.1 | 18.5 | 64.1 | 41.6 | 12.7 | 2.4 | 12.7 | 5.2 | 4.0 | 4.4 | 0.4 |
| 151992 | 89 | 256 | 36 | 51 | 59 | 151 | 43.9 | 84.0 | 0.2 | 0.6 | 19.6 | 65.6 | 47.3 | 12.8 | 2.2 | 9.6 | 11.2 | 4.1 | 5.0 | 0.7 |
| 146807 | 83 | 212 | 54 | 54 | 64 | 145 | 39.0 | 82.5 | 0.4 | 0.6 | 18.2 | 55.0 | 46.5 | 14.5 | 1.7 | 10.5 | 8.8 | 4.4 | 3.8 | 0.7 |
| 155060 | 85 | 272 | 25 | 44 | 63 | 146 | 40.2 | 71.7 | 0.3 | 0.7 | 19.4 | 64.1 | 50.7 | 14.2 | 1.2 | 11.5 | 10.5 | 4.8 | 4.4 | 0.5 |
| 144658 | 81 | 246 | 39 | 48 | 35 | 146 | 42.0 | 70.1 | 0.3 | 0.3 | 16.3 | 57.4 | 53.3 | 14.9 | 2.4 | 8.0 | 7.2 | 4.9 | 2.8 | 0.5 |
| 144957 | 88 | 279 | 25 | 53 | 63 | 155 | 39.3 | 83.5 | 0.3 | 0.4 | 18.2 | 63.7 | 46.1 | 10.7 | 2.5 | 10.6 | 7.4 | 4.1 | 4.5 | 0.6 |
| 145397 | 80 | 241 | 39 | 54 | 69 | 147 | 45.0 | 78.7 | 0.3 | 0.5 | 18.8 | 62.3 | 48.3 | 12.7 | 1.9 | 11.6 | 9.3 | 3.4 | 4.1 | 1.0 |
| 148758 | 87 | 234 | 39 | 52 | 46 | 153 | 42.8 | 74.6 | 0.2 | 0.6 | 17.1 | 60.8 | 51.6 | 10.8 | 2.5 | 11.8 | 8.5 | 3.9 | 4.6 | 0.8 |
| 158711 | 85 | 240 | 34 | 52 | 48 | 152 | 43.9 | 73.6 | 0.3 | 0.3 | 17.9 | 60.3 | 40.4 | 11.1 | 1.6 | 10.6 | 9.5 | 4.0 | 3.7 | 0.7 |
| 157012 | 86 | 265 | 37 | 45 | 73 | 163 | 44.9 | 77.8 | 0.3 | 0.6 | 18.3 | 64.5 | 45.9 | 12.0 | 2.6 | 10.4 | 8.2 | 4.3 | 3.8 | 0.6 |
| 140594 | 76 | 289 | 37 | 54 | 43 | 156 | 40.2 | 75.2 | 0.2 | 0.3 | 18.8 | 58.1 | 48.4 | 10.3 | 2.1 | 10.3 | 10.5 | 5.0 | 2.5 | 0.6 |
| 153415 | 83 | 247 | 31 | 44 | 58 | 147 | 39.6 | 69.2 | 0.2 | 0.4 | 17.2 | 62.9 | 42.0 | 12.5 | 2.1 | 9.7 | 9.0 | 4.4 | 5.1 | 0.7 |
| 160992 | 93 | 304 | 58 | 50 | 56 | 155 | 40.3 | 76.4 | 0.4 | 0.4 | 20.2 | 62.8 | 46.0 | 13.6 | 2.6 | 10.0 | 9.8 | 4.0 | 3.6 | 0.4 |
| AT13.13.1track1 | | | | | | | | | | | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 151495 | 83 | 271 | 109 | 46 | 63 | 150 | 39.4 | 75.5 | 0.3 | 0.3 | 18.4 | 56.7 | 45.9 | 13.6 | 2.4 | 8.4 | 6.7 | 4.2 | 4.2 | 0.3 |
| 156808 | 83 | 233 | 73 | 49 | 61 | 144 | 37.6 | 80.3 | 0.3 | 0.3 | 17.3 | 60.8 | 52.7 | 12.5 | 1.6 | 9.8 | 7.6 | 4.5 | 4.3 | 0.4 |
| 166601 | 91 | 228 | 86 | 44 | 60 | 157 | 33.7 | 65.4 | 0.2 | 0.4 | 16.8 | 60.2 | 44.2 | 9.9 | 2.1 | 9.5 | 6.9 | 3.6 | 2.7 | 0.6 |
| 153922 | 89 | 254 | 238 | 48 | 79 | 151 | 37.8 | 70.4 | 0.3 | 0.5 | 18.0 | 60.2 | 40.0 | 13.4 | 2.0 | 9.8 | 8.0 | 4.3 | 5.1 | 0.6 |
| 162143 | 90 | 246 | 479 | 47 | 63 | 158 | 32.3 | 74.0 | 0.3 | 0.4 | 16.0 | 50.0 | 41.1 | 11.9 | 2.0 | 10.6 | 6.6 | 3.6 | 4.6 | 0.3 |
| 180246 | 101 | 228 | 598 | 45 | 70 | 155 | 30.7 | 66.4 | 0.4 | 0.4 | 14.5 | 47.6 | 34.5 | 10.5 | 1.9 | 7.1 | 7.1 | 3.1 | 1.2 | 0.2 |
| 132757 | 85 | 206 | 746 | 38 | 61 | 143 | 30.1 | 55.6 | 0.1 | 0.5 | 12.0 | 43.7 | 28.6 | 11.4 | 1.6 | 6.8 | 5.2 | 2.8 | 2.6 | 0.3 |
| 157583 | 93 | 182 | 1079 | 39 | 70 | 136 | 27.8 | 50.9 | 0.2 | 0.4 | 11.3 | 37.0 | 33.1 | 6.2 | 1.4 | 5.8 | 4.8 | 2.2 | 2.3 | 0.4 |
| 149045 | 99 | 167 | 1478 | 38 | 53 | 144 | 20.9 | 48.5 | 0.1 | 2.5 | 10.5 | 33.7 | 28.2 | 6.1 | 1.2 | 6.1 | 3.4 | 2.9 | 1.6 | 0.3 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 163560 | 118 | 189 | 2522 | 41 | 55 | 157 | 24.1 | 45.9 | 0.3 | 0.2 | 11.0 | 31.6 | 24.9 | 5.9 | 1.0 | 7.1 | 3.4 | 1.9 | 2.4 | 0.4 |
| 163266 | 106 | 157 | 2019 | 40 | 71 | 158 | 16.9 | 40.8 | 0.1 | 0.2 | 8.0 | 25.7 | 18.2 | 6.1 | 1.0 | 5.1 | 4.6 | 2.3 | 1.9 | 0.2 |
| 167557 | 115 | 146 | 2802 | 36 | 73 | 139 | 15.7 | 43.7 | 0.1 | 0.2 | 8.6 | 25.6 | 19.0 | 8.3 | 1.1 | 4.3 | 3.8 | 1.7 | 1.0 | 0.3 |
| 154267 | 116 | 125 | 3003 | 36 | 59 | 134 | 13.9 | 30.2 | 0.2 | 0.3 | 6.3 | 19.1 | 18.3 | 4.7 | 1.0 | 4.0 | 1.2 | 1.5 | 0.9 | 0.2 |
| 158089 | 132 | 113 | 3070 | 36 | 55 | 124 | 12.2 | 32.7 | 0.1 | 0.4 | 5.2 | 18.9 | 17.5 | 5.8 | 0.9 | 3.6 | 2.5 | 1.4 | 0.6 | 0.3 |
| 163153 | 124 | 114 | 5129 | 33 | 65 | 139 | 11.8 | 31.9 | 0.1 | 0.3 | 5.3 | 17.8 | 14.4 | 3.0 | 0.6 | 4.2 | 2.2 | 0.9 | 1.0 | 0.1 |
| 164327 | 136 | 109 | 4415 | 36 | 59 | 133 | 10.8 | 28.9 | 0.2 | 0.4 | 5.9 | 18.2 | 16.2 | 5.2 | 0.9 | 4.2 | 2.1 | 0.8 | 1.3 | 0.1 |
| 157849 | 114 | 112 | 2664 | 30 | 69 | 137 | 9.6 | 27.9 | 0.2 | 0.2 | 5.3 | 18.0 | 12.1 | 3.7 | 0.6 | 3.2 | 2.4 | 1.3 | 0.6 | 0.1 |
| 146769 | 129 | 107 | 4024 | 28 | 65 | 131 | 8.8 | 28.6 | 0.1 | 0.2 | 4.3 | 14.4 | 15.5 | 4.5 | 0.7 | 2.2 | 2.3 | 1.0 | 0.6 | 0.2 |
| 161719 | 137 | 131 | 3002 | 40 | 61 | 137 | 10.2 | 28.7 | <LOD | 0.1 | 4.6 | 15.3 | 18.4 | 5.7 | 0.8 | 3.8 | 3.4 | 0.9 | 0.9 | 0.1 |
| 161533 | 136 | 113 | 3544 | 32 | 58 | 142 | 9.7 | 29.5 | 0.2 | 0.2 | 5.4 | 16.0 | 12.9 | 4.4 | 0.8 | 4.8 | 1.9 | 1.2 | 0.8 | 0.2 |
| 159199 | 146 | 129 | 3664 | 33 | 83 | 133 | 9.3 | 31.9 | 0.2 | 0.2 | 5.7 | 16.3 | 13.2 | 3.1 | 1.4 | 3.5 | 1.9 | 0.7 | 1.0 | 0.1 |
| 163993 | 142 | 121 | 5196 | 32 | 62 | 134 | 10.1 | 32.8 | 0.2 | 0.3 | 4.7 | 15.3 | 16.1 | 2.9 | 1.0 | 2.8 | 1.0 | 0.8 | 0.6 | <LOD |
| 153732 | 133 | 105 | 3970 | 31 | 77 | 142 | 8.5 | 34.9 | 0.1 | 0.3 | 4.5 | 16.3 | 13.4 | 3.8 | 0.7 | 3.5 | 2.7 | 1.1 | 0.9 | 0.2 |
| 153477 | 143 | 118 | 3000 | 33 | 79 | 138 | 9.2 | 35.6 | 0.1 | 0.2 | 4.2 | 15.7 | 14.8 | 3.4 | 0.7 | 5.1 | 1.8 | 1.2 | 0.9 | 0.2 |
| 166288 | 138 | 103 | 3739 | 27 | 55 | 135 | 9.9 | 33.4 | 0.1 | 0.3 | 4.2 | 13.9 | 13.2 | 4.8 | 1.1 | 3.3 | 2.0 | 0.7 | 0.5 | 0.1 |
| 179966 | 134 | 139 | 5147 | 35 | 87 | 135 | 11.5 | 33.9 | 0.3 | 0.2 | 6.1 | 17.6 | 15.0 | 4.5 | 1.1 | 4.3 | 1.8 | 1.6 | 0.6 | 0.2 |
| 157768 | 141 | 112 | 5790 | 35 | 53 | 134 | 9.6 | 32.4 | 0.2 | 0.3 | 5.0 | 15.2 | 10.2 | 2.8 | 1.1 | 3.6 | 3.0 | 0.7 | 0.5 | <LOD |
| 145536 | 141 | 122 | 4087 | 34 | 64 | 125 | 9.1 | 33.1 | 0.3 | 0.2 | 4.5 | 12.9 | 10.3 | 2.8 | 0.7 | 2.7 | 2.6 | 0.6 | 0.9 | 0.1 |
| 148918 | 142 | 115 | 4090 | 31 | 88 | 120 | 9.8 | 36.1 | 0.2 | 0.2 | 4.7 | 15.4 | 9.3 | 3.9 | 0.9 | 2.7 | 1.0 | 1.3 | 1.1 | 0.2 |
| 151110 | 138 | 113 | 3319 | 27 | 86 | 121 | 10.8 | 31.8 | 0.1 | 0.2 | 4.5 | 13.2 | 14.0 | 3.4 | 1.1 | 2.3 | 1.7 | 1.0 | 0.7 | 0.2 |
| 150052 | 132 | 102 | 6352 | 33 | 115 | 130 | 10.0 | 31.3 | 0.1 | 0.1 | 4.3 | 13.2 | 11.6 | 4.0 | 0.8 | 2.6 | 2.7 | 1.2 | 1.3 | 0.1 |
| 171463 | 147 | 124 | 3797 | 33 | 96 | 145 | 10.2 | 31.2 | 0.1 | 0.1 | 5.5 | 14.1 | 13.5 | 3.5 | 0.8 | 3.8 | 2.3 | 1.5 | 0.5 | 0.1 |
| 155697 | 140 | 122 | 4817 | 28 | 97 | 134 | 10.2 | 31.5 | 0.2 | 0.2 | 4.1 | 14.9 | 13.4 | 3.8 | 0.8 | 3.4 | 2.3 | 0.4 | 1.3 | <LOD |
| 158419 | 144 | 106 | 3388 | 30 | 66 | 138 | 10.6 | 35.6 | 0.1 | 0.1 | 4.2 | 14.3 | 11.8 | 2.5 | 1.6 | 2.5 | 3.1 | 1.2 | 0.9 | 0.2 |
| 143070 | 131 | 92 | 3481 | 27 | 120 | 122 | 10.4 | 29.0 | 0.1 | 0.3 | 4.1 | 13.9 | 10.7 | 3.0 | 0.8 | 1.1 | 1.4 | 1.8 | <LOD | 0.1 |
| 139142 | 138 | 96 | 3235 | 28 | 92 | 109 | 9.9 | 27.4 | 0.1 | 0.4 | 4.5 | 11.9 | 12.2 | 3.7 | 1.0 | 2.5 | 1.3 | 0.9 | 1.0 | 0.1 |
| AT13.13.1track1 | | | | | | | | | | | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 164558 | 144 | 113 | 4705 | 38 | 106 | 127 | 9.3 | 35.0 | 0.2 | 1.1 | 4.3 | 15.1 | 10.5 | 2.9 | 0.6 | 2.9 | 2.7 | 1.0 | 0.5 | 0.2 |
| 144037 | 143 | 104 | 2816 | 32 | 76 | 113 | 10.3 | 31.1 | 0.4 | 1.8 | 4.1 | 13.8 | 13.2 | 5.0 | 1.1 | 3.3 | 1.9 | 1.0 | 0.7 | 0.1 |
| 156389 | 152 | 106 | 2734 | 29 | 72 | 127 | 11.2 | 32.5 | 0.2 | 1.7 | 4.2 | 14.4 | 10.4 | 3.0 | 0.7 | 3.5 | 2.2 | 1.2 | 0.5 | 0.2 |
| 143472 | 136 | 90 | 3352 | 36 | 90 | 116 | 10.6 | 31.9 | 0.2 | 0.9 | 3.9 | 13.3 | 17.1 | 4.2 | 0.6 | 3.7 | 2.3 | 1.2 | 0.4 | 0.1 |
| 138843 | 131 | 91 | 2988 | 31 | 64 | 105 | 10.8 | 25.1 | 0.1 | 0.6 | 4.6 | 12.3 | 12.1 | 2.4 | 1.0 | 2.8 | 1.8 | 0.8 | 0.6 | 0.1 |
| 143098 | 134 | 99 | 3803 | 30 | 83 | 120 | 10.0 | 22.9 | 0.1 | 0.4 | 3.6 | 12.0 | 9.1 | 3.3 | 1.1 | 4.3 | 1.8 | 0.5 | 1.3 | 0.1 |
| 147000 | 139 | 98 | 2453 | 27 | 67 | 115 | 11.4 | 27.7 | 0.2 | 0.2 | 4.4 | 13.4 | 15.0 | 4.0 | 0.8 | 3.4 | 1.6 | 1.0 | 1.3 | 0.1 |
| 155208 | 140 | 108 | 3699 | 30 | 87 | 117 | 10.2 | 29.6 | 0.2 | 0.2 | 4.6 | 15.4 | 12.8 | 4.2 | 1.1 | 3.3 | 1.7 | 0.6 | 0.4 | 0.2 |
| 151670 | 146 | 113 | 2760 | 29 | 106 | 123 | 10.9 | 32.1 | 0.2 | 0.3 | 4.3 | 15.1 | 11.9 | 3.8 | 0.8 | 3.4 | 1.8 | 0.5 | 0.6 | 0.1 |
| 150055 | 141 | 98 | 3454 | 34 | 90 | 133 | 10.3 | 29.9 | 0.2 | 0.2 | 4.1 | 12.4 | 13.6 | 2.6 | 0.6 | 1.8 | 2.9 | 1.1 | 0.8 | 0.2 |
| 164322 | 140 | 116 | 3321 | 33 | 72 | 136 | 10.6 | 34.3 | 0.2 | 0.2 | 5.6 | 14.5 | 14.9 | 4.6 | 1.1 | 3.7 | 3.0 | 0.8 | 0.7 | 0.2 |
| 161558 | 142 | 109 | 4228 | 32 | 104 | 126 | 9.2 | 26.9 | 0.2 | 0.2 | 4.9 | 15.7 | 11.7 | 4.4 | 0.7 | 3.4 | 3.0 | 0.6 | 0.4 | <LOD |
| 155403 | 138 | 95 | 3365 | 30 | 103 | 124 | 11.0 | 30.7 | 0.2 | 0.3 | 4.3 | 15.3 | 11.5 | 3.8 | 0.8 | 4.1 | 2.1 | 0.4 | 1.0 | <LOD |
| 148894 | 149 | 116 | 3528 | 32 | 79 | 138 | 9.6 | 34.6 | 0.2 | 0.2 | 6.0 | 14.5 | 13.5 | 3.9 | 0.7 | 2.4 | 2.9 | 0.9 | 0.7 | 0.1 |
| 143745 | 138 | 101 | 5520 | 30 | 94 | 127 | 10.2 | 27.8 | 0.2 | 0.2 | 4.4 | 16.3 | 11.8 | 3.3 | 0.8 | 4.0 | 3.3 | 1.4 | 1.2 | 0.1 |
| 165894 | 145 | 117 | 4587 | 32 | 96 | 127 | 10.6 | 36.0 | 0.2 | 0.2 | 4.7 | 17.1 | 12.4 | 4.4 | 0.8 | 3.0 | 2.2 | 1.1 | 0.5 | 0.2 |
| 165861 | 141 | 114 | 3098 | 36 | 102 | 138 | 9.9 | 31.6 | 0.2 | 0.2 | 4.7 | 14.6 | 11.3 | 3.2 | 0.9 | 3.8 | 2.4 | 0.8 | <LOD | <LOD |
| 155174 | 146 | 121 | 5116 | 30 | 66 | 139 | 9.0 | 30.5 | 0.2 | 0.2 | 3.8 | 14.8 | 12.1 | 3.6 | 0.9 | 1.7 | 1.7 | 1.0 | 0.5 | 0.1 |
| 143818 | 139 | 113 | 4794 | 32 | 79 | 127 | 10.2 | 37.8 | 0.1 | 0.1 | 4.9 | 16.1 | 12.3 | 4.5 | 0.7 | 2.2 | 2.0 | 1.5 | 1.1 | 0.1 |
| 144082 | 141 | 104 | 4272 | 30 | 74 | 131 | 9.2 | 29.9 | 0.2 | 0.3 | 5.5 | 14.6 | 14.1 | 3.1 | 1.2 | 2.4 | 2.5 | 1.5 | 0.5 | 0.2 |
| 168124 | 136 | 119 | 3854 | 30 | 67 | 136 | 10.3 | 29.9 | 0.2 | 0.3 | 5.4 | 18.2 | 12.5 | 5.9 | 0.9 | 4.0 | 2.1 | 1.3 | <LOD | 0.4 |
| 160574 | 140 | 104 | 3262 | 32 | 91 | 139 | 10.1 | 31.9 | 0.1 | 0.2 | 6.2 | 16.8 | 14.6 | 4.5 | 0.6 | 2.7 | 2.5 | 1.2 | 1.0 | <LOD |
| 150602 | 136 | 138 | 3450 | 35 | 95 | 131 | 10.6 | 34.5 | 0.2 | 0.1 | 5.8 | 16.1 | 12.6 | 4.2 | 1.2 | 3.2 | 2.7 | 1.7 | 0.6 | 0.2 |
| 165760 | 139 | 126 | 3511 | 32 | 61 | 131 | 11.2 | 34.7 | 0.2 | 0.2 | 6.0 | 20.1 | 14.9 | 5.4 | 1.4 | 3.9 | 2.1 | 0.9 | 1.0 | 0.3 |
| 168421 | 130 | 137 | 4175 | 35 | 67 | 147 | 11.9 | 33.8 | 0.1 | 0.2 | 6.8 | 19.5 | 18.1 | 5.7 | 0.9 | 3.9 | 3.0 | 1.9 | 1.0 | 0.2 |
| 150483 | 128 | 130 | 3203 | 27 | 82 | 134 | 10.9 | 40.4 | 0.2 | 0.1 | 6.8 | 20.6 | 19.1 | 2.9 | 0.9 | 3.5 | 2.7 | 1.5 | 1.3 | 0.1 |
| 145286 | 135 | 136 | 4834 | 35 | 61 | 128 | 12.6 | 42.1 | 0.2 | 0.3 | 5.9 | 21.3 | 20.5 | 4.4 | 0.7 | 2.7 | 2.2 | 1.5 | 1.6 | 0.1 |
| 147804 | 121 | 144 | 2689 | 33 | 56 | 145 | 16.9 | 37.7 | 0.1 | 0.3 | 7.5 | 22.6 | 18.7 | 4.8 | 1.4 | 4.0 | 2.9 | 1.8 | 1.4 | <LOD |
| 164331 | 117 | 145 | 2585 | 37 | 72 | 146 | 16.2 | 41.1 | 0.1 | 0.2 | 7.6 | 28.2 | 25.2 | 7.4 | 1.3 | 5.9 | 4.8 | 1.0 | 1.2 | 0.2 |
| 178519 | 127 | 166 | 3164 | 37 | 87 | 145 | 17.4 | 41.6 | 0.2 | 0.3 | 9.8 | 26.3 | 23.5 | 4.9 | 1.4 | 5.2 | 3.9 | 2.0 | 2.7 | 0.3 |
| 161968 | 110 | 139 | 2225 | 35 | 70 | 143 | 20.3 | 45.2 | 0.2 | 0.2 | 8.2 | 26.7 | 24.3 | 7.6 | 1.0 | 5.1 | 4.4 | 2.6 | 1.5 | 0.2 |
| 158391 | 128 | 178 | 2538 | 42 | 45 | 145 | 21.9 | 41.0 | 0.3 | 0.2 | 9.7 | 32.7 | 25.5 | 6.1 | 1.1 | 5.5 | 3.8 | 2.4 | 3.4 | 0.5 |
| 151986 | 124 | 172 | 2544 | 40 | 70 | 148 | 21.5 | 46.1 | 0.2 | 0.2 | 11.7 | 36.1 | 30.6 | 8.2 | 1.8 | 5.8 | 4.5 | 2.9 | 1.5 | 0.2 |
| 150460 | 106 | 176 | 1977 | 35 | 71 | 142 | 24.5 | 50.8 | 0.2 | 0.3 | 10.2 | 39.3 | 27.1 | 6.7 | 1.9 | 5.7 | 6.7 | 3.0 | 1.7 | 0.2 |
| 154654 | 106 | 185 | 1409 | 42 | 55 | 138 | 24.2 | 56.4 | 0.2 | 0.3 | 12.5 | 41.3 | 34.7 | 6.5 | 1.5 | 8.5 | 6.3 | 2.7 | 1.9 | 0.5 |
| 159756 | 104 | 191 | 1663 | 41 | 69 | 139 | 27.4 | 60.1 | 0.2 | 0.9 | 12.8 | 40.3 | 33.2 | 10.2 | 1.4 | 8.1 | 6.7 | 3.1 | 2.2 | 0.5 |
| 147445 | 94 | 221 | 1556 | 36 | 54 | 134 | 25.9 | 68.6 | 0.1 | 0.3 | 14.2 | 44.9 | 42.3 | 9.9 | 1.4 | 7.4 | 6.0 | 3.0 | 2.4 | 0.4 |
| 178544 | 111 | 229 | 1127 | 44 | 77 | 153 | 31.7 | 75.0 | 0.3 | 0.5 | 16.5 | 53.7 | 44.0 | 10.8 | 1.9 | 10.1 | 8.2 | 3.9 | 2.5 | 0.3 |
| AT13.1track2 | | | | | | | | | | | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 80813 | 49 | 115 | 169 | 28 | 61 | 388 | 29.2 | 141.6 | 12.3 | 283.2 | 34.7 | 78.3 | 37.9 | 9.1 | 1.6 | 6.7 | 5.5 | 2.3 | 1.6 | 0.5 |
| 94976 | 55 | 136 | 114 | 25 | 65 | 338 | 28.0 | 126.0 | 11.2 | 329.7 | 33.3 | 73.2 | 34.7 | 9.3 | 1.7 | 6.8 | 4.7 | 2.9 | 2.3 | 0.5 |
| 105345 | 57 | 119 | 310 | 32 | 55 | 340 | 26.7 | 109.9 | 9.6 | 324.4 | 29.5 | 66.9 | 38.0 | 10.0 | 1.1 | 5.9 | 4.3 | 3.2 | 2.6 | 0.3 |
| 116685 | 74 | 148 | 211 | 35 | 93 | 337 | 32.0 | 124.8 | 9.4 | 321.9 | 28.7 | 65.6 | 36.5 | 6.7 | 1.8 | 6.7 | 6.9 | 3.3 | 3.2 | 0.4 |
| 121102 | 63 | 137 | 345 | 31 | 96 | 296 | 27.5 | 106.9 | 7.8 | 250.3 | 27.6 | 62.9 | 32.7 | 7.3 | 1.6 | 8.2 | 6.8 | 2.0 | 2.8 | 0.6 |
| 110183 | 63 | 126 | 292 | 32 | 67 | 228 | 22.1 | 89.8 | 6.9 | 162.4 | 26.7 | 54.1 | 33.0 | 8.1 | 1.2 | 7.6 | 5.1 | 1.9 | 1.7 | 0.2 |
| 119885 | 64 | 123 | 354 | 28 | 66 | 203 | 26.2 | 91.0 | 6.6 | 113.4 | 25.2 | 61.9 | 35.7 | 7.3 | 1.5 | 6.0 | 6.5 | 2.1 | 2.4 | 0.3 |
| 128190 | 76 | 156 | 356 | 32 | 110 | 208 | 28.9 | 100.8 | 5.7 | 81.7 | 22.8 | 59.1 | 33.2 | 8.9 | 1.6 | 8.1 | 5.3 | 2.5 | 2.8 | 0.2 |
| 139021 | 74 | 188 | 305 | 37 | 84 | 173 | 28.9 | 95.8 | 5.1 | 55.8 | 20.5 | 60.9 | 43.1 | 8.0 | 1.4 | 7.4 | 5.9 | 3.5 | 2.9 | 0.4 |
| 145271 | 82 | 187 | 293 | 34 | 83 | 162 | 30.2 | 86.7 | 4.1 | 40.3 | 23.5 | 58.2 | 34.8 | 7.7 | 1.6 | 8.0 | 6.7 | 4.2 | 2.6 | 0.4 |
| 144543 | 82 | 223 | 314 | 39 | 51 | 157 | 31.4 | 87.9 | 3.1 | 30.6 | 18.1 | 55.1 | 43.6 | 12.8 | 2.2 | 10.4 | 6.0 | 3.1 | 2.1 | 0.4 |
| 144118 | 81 | 203 | 311 | 41 | 61 | 160 | 26.3 | 92.6 | 2.4 | 20.6 | 17.6 | 53.4 | 38.4 | 10.2 | 1.8 | 7.0 | 4.6 | 3.6 | 2.9 | 0.5 |
| 141105 | 80 | 213 | 133 | 38 | 45 | 158 | 33.4 | 84.7 | 2.1 | 16.9 | 17.8 | 59.7 | 51.4 | 11.9 | 1.5 | 9.0 | 8.1 | 2.7 | 2.5 | 0.3 |
| 155650 | 87 | 213 | 165 | 41 | 60 | 151 | 34.2 | 82.4 | 1.4 | 13.7 | 20.7 | 60.0 | 48.4 | 8.1 | 2.1 | 9.6 | 10.0 | 4.3 | 4.9 | 0.3 |
| 147346 | 82 | 270 | 213 | 50 | 76 | 158 | 38.4 | 84.7 | 1.3 | 9.1 | 22.8 | 64.1 | 44.5 | 14.3 | 1.7 | 10.6 | 7.8 | 5.2 | 3.0 | 0.7 |
| 163637 | 83 | 275 | 167 | 55 | 48 | 163 | 40.3 | 90.9 | 1.2 | 7.0 | 18.7 | 65.6 | 48.8 | 12.6 | 2.1 | 11.4 | 9.5 | 3.6 | 5.1 | 0.4 |
| 148766 | 84 | 282 | 161 | 46 | 66 | 165 | 36.9 | 90.4 | 0.6 | 4.2 | 21.1 | 67.4 | 51.9 | 13.0 | 3.0 | 11.5 | 8.7 | 4.4 | 3.5 | 0.5 |
| 136601 | 76 | 288 | 101 | 41 | 54 | 144 | 38.5 | 89.3 | 0.4 | 3.2 | 18.4 | 62.2 | 50.1 | 12.1 | 2.5 | 11.1 | 8.9 | 4.4 | 3.4 | 0.7 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 178255 | 87 | 252 | 96 | 48 | 51 | 152 | 46.2 | 89.2 | 0.5 | 2.4 | 22.3 | 69.0 | 59.1 | 12.1 | 2.3 | 10.8 | 9.9 | 4.6 | 3.8 | 0.4 |
| 153906 | 89 | 286 | 95 | 51 | 40 | 150 | 40.4 | 91.3 | 0.4 | 2.5 | 22.8 | 75.5 | 48.6 | 13.6 | 2.3 | 11.0 | 8.0 | 3.5 | 3.4 | 0.5 |
| 166184 | 87 | 304 | 78 | 47 | 54 | 154 | 48.5 | 104.1 | 0.4 | 2.2 | 22.7 | 73.4 | 53.3 | 15.9 | 3.1 | 12.6 | 10.6 | 4.7 | 5.3 | 0.6 |
| 153183 | 77 | 276 | 58 | 47 | 50 | 136 | 41.2 | 88.2 | 0.5 | 1.6 | 21.4 | 71.1 | 51.2 | 12.9 | 2.8 | 11.1 | 9.3 | 5.4 | 3.0 | 0.5 |
| 165291 | 82 | 297 | 35 | 45 | 46 | 130 | 45.3 | 91.4 | 0.8 | 2.0 | 20.8 | 73.2 | 62.2 | 13.3 | 2.3 | 11.4 | 8.1 | 4.5 | 3.5 | 1.0 |
| 157842 | 79 | 312 | 35 | 45 | 43 | 146 | 47.3 | 96.8 | 0.4 | 1.7 | 23.5 | 71.4 | 54.3 | 15.6 | 2.9 | 12.6 | 10.1 | 4.3 | 4.0 | 0.5 |
| 163265 | 94 | 287 | 33 | 44 | 37 | 143 | 44.3 | 101.6 | 0.4 | 1.9 | 24.0 | 71.9 | 54.0 | 14.1 | 2.3 | 11.7 | 10.0 | 5.0 | 3.5 | 0.5 |
| 160444 | 82 | 260 | 43 | 44 | 43 | 136 | 46.7 | 100.4 | 0.4 | 1.7 | 23.1 | 69.0 | 46.1 | 13.0 | 2.6 | 11.5 | 10.0 | 3.9 | 4.1 | 0.6 |
| 151707 | 89 | 280 | 27 | 48 | 46 | 143 | 48.9 | 101.2 | 0.4 | 1.9 | 23.1 | 78.4 | 54.9 | 14.4 | 2.6 | 12.0 | 9.0 | 4.8 | 3.4 | 0.7 |
| 143669 | 82 | 315 | 32 | 51 | 60 | 140 | 45.4 | 101.5 | 0.5 | 1.7 | 24.3 | 78.8 | 55.5 | 17.6 | 2.1 | 13.6 | 9.3 | 5.2 | 4.8 | 0.4 |
| 144840 | 79 | 294 | <LOD | 45 | 50 | 135 | 40.1 | 96.9 | 0.4 | 1.5 | 20.1 | 70.1 | 51.7 | 15.5 | 2.6 | 10.3 | 8.3 | 4.9 | 4.0 | 0.6 |
| 157902 | 81 | 328 | <LOD | 47 | 37 | 141 | 45.3 | 98.4 | 0.2 | 1.9 | 24.1 | 77.6 | 57.3 | 18.6 | 2.7 | 11.9 | 8.3 | 6.5 | 6.6 | 0.7 |
| 153322 | 78 | 296 | 25 | 47 | 50 | 148 | 49.2 | 99.6 | 0.5 | 1.7 | 20.8 | 73.3 | 59.9 | 14.8 | 2.1 | 13.8 | 8.3 | 5.4 | 5.0 | 0.6 |
| 164701 | 83 | 316 | <LOD | 47 | 46 | 141 | 47.6 | 89.6 | 0.4 | 1.6 | 22.7 | 70.3 | 55.9 | 15.9 | 2.1 | 11.1 | 11.2 | 3.8 | 5.4 | 0.4 |
| 172230 | 90 | 313 | 36 | 46 | 41 | 146 | 49.5 | 101.9 | 0.5 | 1.8 | 21.9 | 69.9 | 56.8 | 12.8 | 2.5 | 10.8 | 8.8 | 3.5 | 4.5 | 0.5 |
| 157572 | 85 | 260 | 26 | 51 | 44 | 158 | 47.3 | 98.5 | 0.3 | 1.7 | 21.4 | 76.3 | 61.0 | 14.0 | 2.7 | 12.5 | 10.3 | 4.1 | 5.3 | 0.4 |
| 151487 | 92 | 316 | 22 | 43 | 59 | 155 | 47.1 | 99.3 | 0.4 | 1.6 | 21.7 | 69.7 | 65.7 | 14.8 | 2.0 | 14.3 | 9.1 | 4.6 | 2.3 | 0.4 |
| 154961 | 78 | 263 | 29 | 49 | 33 | 151 | 45.6 | 94.3 | 0.5 | 1.4 | 19.6 | 70.7 | 46.8 | 11.9 | 2.3 | 12.3 | 9.7 | 4.7 | 3.4 | 0.6 |
| AT13.1track2 | | | | | | | | | | | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 146251 | 73 | 290 | 35 | 46 | 36 | 148 | 43.4 | 87.7 | 0.3 | 1.3 | 19.7 | 67.3 | 56.1 | 14.9 | 2.2 | 11.1 | 9.3 | 4.6 | 3.8 | 0.7 |
| 136451 | 87 | 283 | 43 | 50 | 30 | 146 | 41.4 | 85.6 | 0.5 | 1.4 | 19.7 | 67.5 | 49.0 | 10.0 | 2.2 | 12.2 | 8.7 | 4.8 | 3.7 | 0.8 |
| 174420 | 85 | 276 | 25 | 51 | 42 | 158 | 44.1 | 97.1 | 0.4 | 1.6 | 22.3 | 66.1 | 49.0 | 13.1 | 2.0 | 8.7 | 9.7 | 4.6 | 4.4 | 0.7 |
| 146514 | 87 | 282 | 37 | 45 | 49 | 143 | 40.8 | 90.0 | 0.4 | 1.4 | 20.9 | 67.3 | 51.9 | 11.4 | 2.4 | 8.8 | 9.8 | 4.2 | 4.1 | 0.5 |
| 152696 | 86 | 275 | 43 | 43 | 58 | 148 | 44.0 | 87.4 | 0.3 | 1.2 | 20.6 | 67.0 | 50.3 | 13.1 | 3.0 | 11.7 | 9.3 | 4.2 | 5.1 | 0.5 |
| 134706 | 80 | 261 | 42 | 45 | 67 | 143 | 39.8 | 83.3 | 0.4 | 1.4 | 19.6 | 62.1 | 46.5 | 12.7 | 2.0 | 7.7 | 8.9 | 4.5 | 3.0 | 0.5 |
| 152340 | 89 | 269 | 54 | 50 | 54 | 166 | 39.5 | 82.9 | 0.3 | 1.2 | 19.8 | 61.2 | 47.4 | 14.7 | 2.0 | 11.5 | 8.5 | 4.4 | 3.5 | 0.5 |
| 158405 | 84 | 284 | 57 | 43 | 55 | 166 | 40.0 | 80.8 | 0.3 | 1.5 | 17.9 | 62.4 | 51.0 | 10.5 | 2.1 | 10.2 | 7.5 | 3.7 | 2.7 | 0.5 |
| 159035 | 80 | 261 | 51 | 45 | 38 | 173 | 39.0 | 86.2 | 0.3 | 1.3 | 19.4 | 58.9 | 47.3 | 13.1 | 1.8 | 8.7 | 7.2 | 3.2 | 2.0 | 0.5 |
| 146707 | 78 | 232 | 73 | 40 | 52 | 165 | 37.8 | 81.7 | 0.3 | 1.2 | 18.3 | 59.6 | 44.4 | 11.4 | 1.8 | 9.7 | 8.2 | 3.7 | 2.5 | 0.3 |
| 147779 | 89 | 241 | 79 | 43 | 54 | 157 | 33.3 | 67.5 | 0.3 | 1.2 | 16.8 | 53.1 | 39.7 | 11.1 | 2.3 | 9.9 | 5.8 | 3.3 | 3.8 | 0.5 |
| 154598 | 87 | 267 | 123 | 46 | 49 | 176 | 32.5 | 82.9 | 0.3 | 1.1 | 18.4 | 59.1 | 44.0 | 8.7 | 2.1 | 10.0 | 8.3 | 3.5 | 2.4 | 0.7 |
| 141058 | 88 | 237 | 94 | 45 | 47 | 162 | 32.5 | 74.2 | 0.3 | 1.1 | 15.8 | 55.7 | 42.6 | 13.7 | 2.4 | 9.1 | 7.6 | 4.8 | 2.1 | 0.3 |
| 155891 | 85 | 235 | 165 | 40 | 52 | 170 | 31.3 | 78.7 | 0.4 | 1.4 | 16.3 | 55.6 | 34.5 | 11.4 | 1.6 | 7.9 | 6.4 | 3.0 | 2.7 | 0.4 |
| 150113 | 83 | 205 | 226 | 40 | 48 | 160 | 32.0 | 78.6 | 0.3 | 1.1 | 16.7 | 45.3 | 36.8 | 10.6 | 2.2 | 7.6 | 5.9 | 4.4 | 1.7 | 0.4 |
| 157809 | 83 | 198 | 273 | 42 | 41 | 157 | 30.4 | 65.0 | 0.3 | 0.9 | 14.1 | 43.6 | 34.6 | 9.9 | 2.2 | 7.6 | 5.9 | 2.6 | 3.9 | 0.6 |
| 147042 | 87 | 199 | 390 | 40 | 58 | 163 | 26.7 | 53.9 | 0.3 | 0.9 | 12.3 | 38.9 | 24.8 | 8.3 | 1.7 | 8.8 | 5.1 | 3.3 | 2.5 | 0.3 |
| 146950 | 85 | 178 | 364 | 38 | 47 | 156 | 25.9 | 59.6 | 0.4 | 1.0 | 12.0 | 40.9 | 36.2 | 8.9 | 1.7 | 6.4 | 5.3 | 3.1 | 2.8 | 0.3 |
| 147401 | 95 | 183 | 562 | 37 | 47 | 163 | 25.6 | 51.9 | 0.4 | 1.0 | 12.5 | 42.9 | 28.6 | 6.7 | 1.9 | 6.1 | 5.2 | 2.5 | 1.3 | 0.3 |
| 145050 | 103 | 174 | 515 | 35 | 50 | 162 | 23.5 | 53.7 | 0.2 | 0.8 | 12.4 | 37.7 | 30.7 | 10.8 | 1.9 | 7.2 | 5.8 | 1.4 | 2.0 | 0.1 |
| 141557 | 101 | 150 | 679 | 44 | 46 | 154 | 22.8 | 49.2 | 0.2 | 0.8 | 10.8 | 35.0 | 28.8 | 7.9 | 1.6 | 6.9 | 4.1 | 2.0 | 1.7 | 0.3 |
| 164166 | 101 | 154 | 646 | 42 | 60 | 184 | 22.8 | 60.0 | 0.2 | 0.9 | 12.2 | 35.4 | 25.5 | 7.8 | 1.9 | 6.0 | 6.4 | 1.8 | 1.4 | 0.2 |
| 146122 | 114 | 143 | 946 | 44 | 65 | 151 | 19.7 | 47.9 | 0.2 | 0.9 | 10.9 | 32.9 | 27.1 | 6.5 | 1.6 | 6.5 | 4.8 | 2.4 | 1.9 | 0.3 |
| 163464 | 107 | 123 | 858 | 37 | 78 | 146 | 18.6 | 42.7 | 0.2 | 0.8 | 8.7 | 30.3 | 20.8 | 7.4 | 1.7 | 6.6 | 3.2 | 2.4 | 1.3 | 0.3 |
| 156592 | 112 | 122 | 923 | 40 | 42 | 147 | 18.6 | 44.9 | 0.2 | 0.6 | 9.3 | 25.9 | 21.2 | 5.4 | 0.9 | 4.7 | 4.3 | 1.3 | 1.8 | 0.2 |
| 130816 | 116 | 109 | 1562 | 36 | 52 | 131 | 17.2 | 37.2 | 0.3 | 0.5 | 8.2 | 27.3 | 20.4 | 4.0 | 1.5 | 3.7 | 6.2 | 2.4 | 0.7 | 0.2 |
| 175919 | 110 | 117 | 1394 | 43 | 50 | 139 | 16.4 | 39.6 | 0.1 | 0.6 | 7.0 | 25.1 | 21.3 | 6.5 | 1.2 | 6.5 | 3.3 | 1.0 | 1.4 | 0.3 |
| 153552 | 122 | 112 | 1030 | 37 | 63 | 130 | 17.3 | 35.6 | 0.2 | 0.6 | 7.5 | 24.7 | 18.9 | 4.9 | 1.3 | 5.7 | 4.2 | 1.5 | 1.5 | 0.2 |
| 164201 | 134 | 126 | 1605 | 40 | 66 | 148 | 15.8 | 37.9 | 0.2 | 0.6 | 6.1 | 25.5 | 24.4 | 5.7 | 1.0 | 4.4 | 4.2 | 2.5 | 1.2 | 0.3 |
| 162682 | 135 | 105 | 1755 | 37 | 58 | 136 | 18.0 | 40.2 | 0.1 | 0.8 | 8.1 | 22.8 | 19.4 | 5.3 | 1.1 | 6.0 | 2.6 | 1.7 | 1.2 | 0.2 |
| 155430 | 130 | 109 | 1376 | 38 | 66 | 136 | 14.9 | 39.1 | 0.1 | 0.7 | 7.3 | 22.8 | 15.8 | 6.2 | 1.7 | 3.4 | 3.4 | 1.6 | 1.7 | 0.2 |
| 169295 | 131 | 107 | 1429 | 35 | 51 | 140 | 15.7 | 37.6 | 0.1 | 0.7 | 7.1 | 25.8 | 17.5 | 4.6 | 0.9 | 3.7 | 3.5 | 1.5 | 1.0 | 0.2 |
| 156024 | 128 | 92 | 1157 | 27 | 49 | 134 | 14.6 | 34.8 | 0.1 | 0.7 | 7.0 | 21.8 | 17.9 | 5.0 | 1.2 | 4.0 | 3.9 | 0.8 | 1.5 | 0.2 |
| 161775 | 136 | 114 | 1249 | 40 | 66 | 128 | 15.1 | 31.9 | 0.2 | 0.5 | 6.3 | 18.4 | 17.7 | 4.9 | 1.1 | 4.9 | 3.7 | 1.9 | 0.9 | 0.1 |
| 175532 | 132 | 103 | 1210 | 30 | 51 | 137 | 15.0 | 35.5 | 0.1 | 0.5 | 6.7 | 20.9 | 17.5 | 5.6 | 1.1 | 4.5 | 3.0 | 1.7 | 2.1 | 0.3 |
| 170049 | 130 | 123 | 1574 | 40 | 52 | 147 | 16.3 | 32.3 | 0.2 | 0.7 | 6.6 | 19.6 | 19.7 | 5.5 | 1.3 | 5.0 | 4.2 | 1.2 | 1.2 | 0.1 |
| AT13.1track2 | | | | | | | | | | | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 152887 | 136 | 93 | 1137 | 29 | 54 | 130 | 13.2 | 34.8 | 0.2 | 0.4 | 5.5 | 19.3 | 15.2 | 3.7 | 0.9 | 4.3 | 2.4 | 1.3 | 0.7 | 0.1 |
| 140637 | 134 | 98 | 1763 | 31 | 46 | 123 | 13.1 | 31.0 | 0.1 | 0.4 | 4.4 | 17.7 | 16.5 | 4.8 | 1.2 | 5.7 | 3.0 | 1.3 | 0.6 | 0.1 |
| 144365 | 118 | 89 | 1063 | 30 | 48 | 135 | 13.2 | 30.7 | 0.2 | 0.6 | 5.6 | 20.1 | 16.5 | 3.9 | 1.1 | 4.9 | 3.4 | 1.1 | 1.4 | 0.1 |
| 157423 | 129 | 103 | 1032 | 30 | 46 | 140 | 12.9 | 36.9 | 0.2 | 0.5 | 6.2 | 19.6 | 17.1 | 3.9 | 1.5 | 4.2 | 4.2 | 1.2 | 2.0 | 0.1 |
| 170877 | 133 | 117 | 1323 | 38 | 53 | 133 | 15.0 | 29.7 | 0.1 | 0.6 | 6.1 | 19.0 | 16.3 | 5.1 | 0.8 | 4.6 | 2.7 | 1.1 | 1.2 | 0.2 |
| 159861 | 114 | 105 | 1058 | 36 | 53 | 146 | 13.9 | 35.1 | 0.1 | 0.5 | 6.5 | 18.6 | 14.5 | 5.7 | 1.0 | 4.4 | 3.6 | 1.6 | 1.2 | 0.1 |
| 162842 | 129 | 114 | 1223 | 36 | 44 | 140 | 12.8 | 33.9 | 0.2 | 0.4 | 5.6 | 19.2 | 16.7 | 4.2 | 1.2 | 4.4 | 1.6 | 1.5 | 0.8 | 0.1 |
| 153593 | 126 | 98 | 1362 | 31 | 45 | 149 | 13.5 | 34.1 | 0.1 | 0.5 | 5.1 | 21.9 | 18.0 | 4.8 | 1.1 | 4.6 | 2.9 | 2.1 | 1.4 | 0.3 |
| 159085 | 116 | 98 | 1151 | 31 | 64 | 139 | 15.0 | 33.3 | 0.1 | 0.6 | 6.3 | 23.5 | 21.1 | 3.7 | 0.8 | 5.1 | 4.5 | 1.3 | 0.7 | 0.2 |
| 173731 | 112 | 108 | 857 | 28 | 47 | 142 | 15.7 | 32.1 | 0.3 | 0.4 | 7.2 | 23.6 | 23.8 | 4.2 | 1.4 | 5.5 | 4.3 | 1.2 | 1.2 | 0.1 |
| 167114 | 114 | 99 | 1104 | 34 | 61 | 142 | 15.1 | 33.1 | 0.1 | 0.5 | 6.0 | 21.4 | 14.0 | 5.2 | 2.0 | 3.5 | 3.1 | 1.1 | 0.5 | 0.3 |
| 166099 | 120 | 135 | 1150 | 35 | 39 | 148 | 16.0 | 36.8 | 0.1 | 0.4 | 6.9 | 24.0 | 23.6 | 6.0 | 1.5 | 4.5 | 4.3 | 2.2 | 2.0 | 0.3 |
| 165025 | 114 | 124 | 945 | 37 | 68 | 152 | 15.4 | 36.4 | 0.2 | 0.5 | 7.4 | 27.4 | 23.9 | 7.5 | 1.3 | 4.6 | 4.5 | 1.6 | 1.3 | 0.1 |
| 153040 | 102 | 118 | 684 | 36 | 42 | 139 | 14.3 | 37.1 | 0.2 | 0.6 | 7.8 | 23.0 | 20.9 | 4.2 | 1.0 | 5.0 | 2.9 | 2.0 | 1.2 | 0.2 |
| 158164 | 104 | 111 | 1062 | 34 | 62 | 137 | 15.3 | 35.5 | 0.1 | 0.6 | 7.4 | 26.0 | 20.7 | 4.6 | 1.1 | 4.4 | 3.2 | 1.8 | 1.6 | 0.3 |
| 155902 | 108 | 132 | 879 | 37 | 52 | 157 | 17.8 | 36.2 | 0.1 | 0.5 | 8.7 | 26.3 | 21.2 | 5.7 | 1.5 | 4.2 | 2.8 | 2.1 | 2.0 | 0.2 |
| 172266 | 111 | 125 | 642 | 40 | 73 | 155 | 20.2 | 44.8 | 0.2 | 3.3 | 8.5 | 31.1 | 22.5 | 6.5 | 1.4 | 6.1 | 3.6 | 1.5 | 1.6 | 0.2 |
| 160367 | 105 | 146 | 861 | 45 | 66 | 161 | 19.1 | 47.8 | 0.2 | 0.5 | 9.2 | 32.4 | 30.5 | 7.7 | 1.7 | 5.8 | 4.3 | 2.8 | 1.0 | 0.3 |
| 141935 | 107 | 144 | 607 | 38 | 62 | 150 | 19.3 | 48.8 | 0.2 | 0.4 | 10.2 | 34.3 | 31.8 | 4.9 | 1.6 | 8.5 | 4.4 | 2.5 | 2.8 | 0.3 |
| 162556 | 99 | 160 | 560 | 39 | 47 | 153 | 19.7 | 46.7 | 0.3 | 0.4 | 9.8 | 33.8 | 25.8 | 8.7 | 1.4 | 5.7 | 5.8 | 1.8 | 2.1 | 0.2 |
| 156383 | 109 | 163 | 765 | 36 | 56 | 148 | 20.9 | 46.1 | 0.3 | 0.5 | 10.9 | 34.7 | 29.4 | 7.2 | 1.2 | 8.2 | 3.7 | 2.3 | 2.6 | 0.3 |

| PCLava2track1 | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 154122 | 93 | 222 | 350 | 39.1 | 51 | 158 | 34 | 102 | 2.7 | 12.5 | 18.4 | 58.3 | 48.5 | 9.9 | 2.1 | 8.3 | 7.4 | 3.0 | 3.1 | 0.4 |
| 172150 | 106 | 231 | 210 | 43.1 | 58 | 167 | 34 | 109 | 1.7 | 7.7 | 16.3 | 51.5 | 40.0 | 9.8 | 1.5 | 7.2 | 6.4 | 3.4 | 2.2 | 0.2 |
| 142136 | 104 | 192 | 257 | 35.6 | 74 | 158 | 29 | 90 | 1.2 | 4.9 | 14.3 | 47.7 | 33.7 | 8.5 | 1.3 | 6.7 | 5.1 | 2.1 | 3.8 | 0.4 |
| 144460 | 112 | 185 | 591 | 42.5 | 83 | 159 | 24 | 92 | 0.9 | 2.9 | 12.1 | 41.0 | 35.1 | 8.3 | 2.0 | 8.1 | 5.7 | 2.8 | 1.3 | 0.3 |
| 152930 | 113 | 208 | 309 | 39.6 | 64 | 176 | 22 | 98 | 0.7 | 2.3 | 14.5 | 41.3 | 30.9 | 7.5 | 1.4 | 7.5 | 3.6 | 2.5 | 3.1 | 0.2 |
| 166053 | 121 | 195 | 468 | 46.9 | 93 | 155 | 20 | 92 | 0.4 | 1.3 | 14.0 | 42.3 | 31.7 | 9.9 | 1.8 | 5.2 | 4.4 | 1.4 | 3.0 | 0.4 |
| 151504 | 113 | 184 | 590 | 35.4 | 70 | 159 | 20 | 73 | 0.5 | 1.0 | 11.8 | 41.8 | 25.5 | 9.1 | 1.7 | 7.4 | 4.8 | 1.9 | 1.0 | 0.3 |
| 156134 | 125 | 190 | 500 | 35.0 | 90 | 149 | 20 | 79 | 0.5 | 0.5 | 10.3 | 37.1 | 23.5 | 7.0 | 1.4 | 6.8 | 4.5 | 1.9 | 1.5 | 0.3 |
| 160602 | 117 | 195 | 557 | 38.4 | 113 | 157 | 26 | 86 | 0.4 | 0.7 | 15.0 | 45.5 | 33.1 | 7.6 | 1.8 | 9.2 | 6.3 | 2.4 | 2.5 | 0.2 |
| 158240 | 116 | 201 | 551 | 41.5 | 101 | 159 | 28 | 92 | 0.4 | 0.6 | 14.4 | 47.5 | 35.0 | 8.3 | 1.9 | 8.0 | 6.4 | 3.1 | 2.0 | 0.5 |
| 153009 | 121 | 194 | 713 | 40.0 | 102 | 175 | 31 | 110 | 0.5 | 0.6 | 14.5 | 51.1 | 47.6 | 14.2 | 2.1 | 10.1 | 7.6 | 2.9 | 5.4 | 0.7 |
| 153738 | 119 | 235 | 421 | 44.2 | 88 | 159 | 31 | 120 | 0.6 | 0.3 | 18.5 | 55.7 | 49.4 | 14.5 | 2.1 | 8.5 | 7.3 | 4.0 | 3.2 | 0.5 |
| 158401 | 102 | 242 | 498 | 43.9 | 83 | 168 | 41 | 118 | 0.6 | 0.5 | 19.6 | 66.5 | 57.5 | 16.3 | 2.4 | 10.9 | 8.5 | 4.5 | 2.9 | 0.4 |
| 164051 | 106 | 291 | 249 | 45.5 | 101 | 171 | 39 | 148 | 0.8 | 0.5 | 21.3 | 72.1 | 50.3 | 15.1 | 2.9 | 10.2 | 6.7 | 3.7 | 4.4 | 0.6 |
| 165766 | 93 | 294 | 210 | 43.0 | 96 | 179 | 41 | 147 | 0.7 | 0.5 | 23.7 | 72.9 | 51.5 | 18.1 | 2.4 | 11.9 | 8.6 | 4.0 | 4.8 | 0.4 |
| 144420 | 89 | 273 | 106 | 45.5 | 59 | 179 | 39 | 125 | 0.9 | 0.4 | 23.2 | 67.7 | 60.2 | 13.4 | 2.5 | 12.1 | 7.6 | 3.7 | 2.3 | 0.4 |
| 153761 | 90 | 248 | 119 | 45.9 | 77 | 172 | 41 | 129 | 0.7 | 0.6 | 23.0 | 67.2 | 55.4 | 13.7 | 2.4 | 8.5 | 9.8 | 3.3 | 3.2 | 0.4 |
| 169762 | 89 | 270 | 47 | 46.5 | 106 | 198 | 49 | 127 | 0.8 | 0.6 | 23.1 | 70.5 | 47.8 | 14.9 | 3.2 | 7.8 | 7.9 | 4.3 | 3.9 | 0.7 |
| 177318 | 102 | 339 | 67 | 60.4 | 76 | 191 | 42 | 136 | 0.8 | 0.7 | 21.8 | 75.4 | 51.3 | 15.1 | 2.9 | 11.7 | 8.2 | 5.6 | 4.6 | 0.9 |
| 165748 | 85 | 290 | 60 | 48.1 | 77 | 184 | 46 | 117 | 0.5 | 0.6 | 22.5 | 73.0 | 55.9 | 15.0 | 2.6 | 11.4 | 9.3 | 4.5 | 3.4 | 0.5 |
| 170795 | 95 | 320 | 61 | 47.1 | 66 | 169 | 40 | 117 | 0.4 | 0.7 | 23.1 | 67.0 | 58.6 | 13.8 | 2.3 | 12.8 | 8.6 | 4.4 | 4.0 | 0.7 |
| 161615 | 100 | 299 | 116 | 45.8 | 68 | 167 | 44 | 127 | 0.5 | 0.5 | 23.8 | 68.9 | 55.3 | 16.0 | 2.2 | 11.8 | 10.5 | 5.0 | 2.7 | 0.7 |
| 153173 | 98 | 263 | 75 | 55.5 | 78 | 176 | 42 | 123 | 0.6 | 0.7 | 20.6 | 73.5 | 59.8 | 9.9 | 3.3 | 12.9 | 12.6 | 4.8 | 2.9 | 0.4 |
| 167398 | 103 | 227 | 79 | 53.0 | 84 | 171 | 40 | 106 | 0.6 | 0.5 | 20.1 | 62.6 | 57.7 | 15.6 | 2.3 | 12.6 | 8.2 | 5.2 | 2.6 | 0.3 |
| 147114 | 95 | 281 | 201 | 47.2 | 91 | 171 | 37 | 114 | 0.5 | 0.5 | 22.2 | 68.6 | 48.7 | 17.5 | 2.2 | 11.0 | 7.2 | 4.0 | 3.0 | 0.7 |
| 171157 | 113 | 271 | 337 | 34.0 | 73 | 172 | 41 | 121 | 0.5 | 0.6 | 18.6 | 57.7 | 49.8 | 13.4 | 1.9 | 13.9 | 7.6 | 3.4 | 2.7 | 0.2 |
| 165097 | 113 | 249 | 399 | 38.6 | 76 | 184 | 35 | 122 | 0.6 | 0.5 | 17.7 | 59.1 | 47.8 | 11.5 | 2.7 | 11.1 | 6.7 | 4.4 | 2.2 | 0.4 |
| 149605 | 104 | 251 | 326 | 37.5 | 90 | 166 | 32 | 98 | 0.5 | 0.5 | 14.4 | 48.6 | 44.4 | 10.1 | 2.1 | 6.9 | 6.7 | 2.1 | 3.1 | 0.3 |
| 162442 | 110 | 209 | 486 | 46.6 | 87 | 170 | 33 | 101 | 0.4 | 0.4 | 17.9 | 52.1 | 39.1 | 10.8 | 2.2 | 7.5 | 6.5 | 2.9 | 2.5 | 0.4 |
| 150083 | 113 | 223 | 471 | 49.2 | 66 | 167 | 29 | 87 | 0.5 | 0.6 | 14.4 | 52.4 | 41.5 | 8.1 | 1.9 | 11.1 | 5.8 | 3.3 | 1.7 | 0.6 |
| 167511 | 131 | 230 | 794 | 49.1 | 85 | 184 | 34 | 93 | 0.6 | 0.7 | 18.5 | 53.1 | 39.0 | 10.9 | 2.2 | 9.8 | 8.4 | 3.6 | 2.5 | 0.2 |
| 162147 | 109 | 203 | 585 | 41.4 | 84 | 165 | 28 | 87 | 0.4 | 0.5 | 15.1 | 50.9 | 36.8 | 11.7 | 2.0 | 8.4 | 6.1 | 2.1 | 1.3 | 0.4 |
| 143872 | 125 | 217 | 673 | 40.1 | 71 | 156 | 30 | 83 | 0.5 | 0.5 | 17.1 | 51.1 | 44.9 | 15.6 | 1.9 | 6.3 | 4.9 | 3.6 | 3.1 | 0.3 |
| 148881 | 115 | 226 | 828 | 42.3 | 77 | 172 | 28 | 83 | 0.6 | 0.7 | 15.7 | 50.7 | 38.0 | 9.9 | 1.9 | 10.6 | 5.6 | 3.1 | 2.0 | 0.3 |
| 166888 | 129 | 194 | 736 | 40.4 | 62 | 154 | 28 | 85 | 0.6 | 0.5 | 15.5 | 50.0 | 35.2 | 11.5 | 1.6 | 8.8 | 6.5 | 4.1 | 2.4 | 0.2 |
| 158975 | 127 | 211 | 1131 | 44.2 | 79 | 166 | 32 | 85 | 0.5 | 0.7 | 16.8 | 50.8 | 39.3 | 12.5 | 2.0 | 9.4 | 6.8 | 4.0 | 2.6 | 0.3 |
| 161253 | 126 | 212 | 964 | 46.9 | 63 | 172 | 28 | 82 | 0.3 | 0.8 | 17.6 | 54.4 | 47.2 | 10.8 | 2.2 | 8.9 | 7.9 | 4.8 | 2.4 | 0.4 |
| 147983 | 104 | 204 | 505 | 40.5 | 83 | 160 | 29 | 76 | 0.3 | 0.7 | 17.1 | 56.2 | 41.5 | 9.5 | 1.8 | 9.3 | 6.7 | 3.6 | 3.1 | 0.3 |
| 148662 | 116 | 205 | 727 | 41.2 | 64 | 164 | 29 | 77 | 0.4 | 0.5 | 17.1 | 50.9 | 41.3 | 11.4 | 1.8 | 9.6 | 7.7 | 3.0 | 3.3 | 0.4 |
| 155265 | 106 | 249 | 498 | 52.7 | 83 | 162 | 32 | 74 | 0.4 | 0.8 | 21.6 | 56.6 | 49.8 | 9.2 | 2.0 | 8.2 | 7.2 | 3.8 | 2.0 | 0.4 |
| 159265 | 112 | 221 | 557 | 44.7 | 83 | 180 | 37 | 73 | 0.3 | 0.6 | 17.9 | 63.1 | 48.0 | 12.5 | 2.2 | 11.7 | 9.5 | 5.2 | 3.0 | 0.4 |
| 158869 | 105 | 273 | 531 | 42.6 | 60 | 172 | 34 | 76 | 0.3 | 0.8 | 16.7 | 58.0 | 43.0 | 7.4 | 2.0 | 9.3 | 8.4 | 3.2 | 3.3 | 0.3 |
| 163979 | 101 | 252 | 722 | 43.6 | 67 | 168 | 33 | 78 | 0.3 | 0.6 | 17.4 | 56.4 | 45.9 | 9.6 | 2.0 | 10.2 | 8.7 | 3.2 | 2.4 | 0.5 |
| 151234 | 104 | 204 | 501 | 42.0 | 61 | 167 | 32 | 85 | 0.5 | 0.8 | 18.1 | 57.0 | 50.5 | 10.0 | 2.0 | 10.2 | 6.6 | 3.3 | 2.1 | 0.3 |
| 151832 | 105 | 250 | 402 | 42.1 | 68 | 164 | 32 | 85 | 0.4 | 0.8 | 15.8 | 53.1 | 44.1 | 11.4 | 2.4 | 8.3 | 7.7 | 2.8 | 4.3 | 0.4 |
| 164624 | 99 | 238 | 427 | 45.2 | 57 | 158 | 35 | 89 | 0.5 | 0.8 | 16.6 | 60.4 | 38.5 | 11.0 | 2.3 | 9.1 | 7.4 | 4.0 | 2.8 | 0.5 |
| 149484 | 100 | 265 | 670 | 41.0 | 56 | 157 | 37 | 79 | 0.5 | 0.6 | 16.4 | 52.3 | 42.7 | 14.0 | 2.0 | 6.3 | 8.2 | 4.0 | 2.1 | 0.3 |
| 162937 | 101 | 242 | 665 | 50.7 | 48 | 164 | 36 | 73 | 0.4 | 1.1 | 16.3 | 60.2 | 37.6 | 13.8 | 2.4 | 10.3 | 7.6 | 3.1 | 3.5 | 0.6 |
| 153677 | 99 | 254 | 453 | 46.0 | 49 | 173 | 32 | 93 | 0.5 | 1.9 | 18.4 | 50.9 | 35.5 | 9.8 | 2.0 | 7.5 | 5.3 | 3.5 | 3.2 | 0.4 |
| 151417 | 89 | 233 | 455 | 41.7 | 59 | 142 | 32 | 87 | 0.5 | 4.2 | 16.4 | 51.6 | 42.7 | 9.5 | 2.0 | 9.6 | 7.1 | 4.2 | 3.3 | 0.6 |
| 145780 | 100 | 251 | 353 | 43.7 | 58 | 150 | 35 | 83 | 0.5 | 9.4 | 14.5 | 56.0 | 43.5 | 10.7 | 1.5 | 8.5 | 8.6 | 2.3 | 3.9 | 0.3 |
| PCLava2track2 | | | | | | | | | | | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 5320 | 5 | 6 | <LOD | <LOD | <LOD | 68 | 20 | 141 | 25.1 | 77.0 | 44.6 | 86.8 | 37.1 | 7.7 | 0.2 | 3.7 | 4.0 | 2.6 | 3.4 | 0.3 |
| 5843 | 4 | 11 | <LOD | 1.0 | <LOD | 76 | 23 | 151 | 24.8 | 87.6 | 48.9 | 89.9 | 28.8 | 7.4 | 0.3 | 3.3 | 2.6 | 2.0 | 2.6 | 0.6 |
| 7787 | 4 | 17 | <LOD | 4.2 | <LOD | 85 | 25 | 145 | 24.8 | 82.1 | 42.7 | 90.2 | 30.8 | 6.0 | 0.4 | 5.3 | 4.0 | 1.9 | 3.4 | 0.5 |
| 13483 | 7 | 30 | <LOD | 6.3 | <LOD | 86 | 27 | 138 | 23.7 | 74.4 | 40.4 | 80.5 | 35.5 | 4.8 | 0.4 | 4.9 | 4.4 | 2.7 | 4.6 | 0.5 |
| 24738 | 13 | 64 | <LOD | 11.0 | <LOD | 101 | 34 | 176 | 24.5 | 83.4 | 50.4 | 101.4 | 45.3 | 8.9 | 0.7 | 7.0 | 5.8 | 3.6 | 3.5 | 0.5 |
| 39592 | 18 | 86 | <LOD | 14.3 | 8 | 112 | 36 | 142 | 21.2 | 72.2 | 45.8 | 100.0 | 46.0 | 10.8 | 1.0 | 8.5 | 8.4 | 4.3 | 3.3 | 0.7 |
| 56217 | 21 | 123 | <LOD | 15.7 | 10 | 116 | 39 | 149 | 18.6 | 63.1 | 47.1 | 101.6 | 48.5 | 12.8 | 1.6 | 10.5 | 10.4 | 4.8 | 5.4 | 1.0 |
| 80044 | 36 | 166 | <LOD | 29.6 | 24 | 124 | 49 | 150 | 17.6 | 51.3 | 41.0 | 108.9 | 51.7 | 12.5 | 2.1 | 11.8 | 9.8 | 5.6 | 5.3 | 0.8 |
| 90082 | 46 | 213 | <LOD | 31.0 | 26 | 121 | 47 | 170 | 14.2 | 39.9 | 47.2 | 117.6 | 64.3 | 14.3 | 1.9 | 12.7 | 10.9 | 6.2 | 5.2 | 0.8 |
| 105695 | 52 | 222 | 23 | 38.3 | 34 | 125 | 53 | 139 | 10.3 | 29.7 | 43.6 | 109.8 | 62.3 | 20.6 | 1.8 | 10.9 | 10.4 | 5.0 | 4.7 | 0.4 |
| 114976 | 61 | 217 | 28 | 35.0 | 40 | 145 | 48 | 143 | 8.7 | 22.5 | 36.3 | 96.5 | 69.4 | 18.3 | 1.8 | 14.0 | 9.7 | 4.2 | 3.8 | 0.6 |
| 140251 | 65 | 260 | 27 | 41.0 | 51 | 134 | 55 | 133 | 6.7 | 19.3 | 36.4 | 95.4 | 62.2 | 17.9 | 1.9 | 10.5 | 8.2 | 6.8 | 5.1 | 0.6 |
| 138223 | 66 | 257 | 50 | 48.9 | 40 | 146 | 48 | 119 | 5.8 | 13.2 | 31.8 | 86.8 | 73.7 | 20.5 | 2.1 | 12.2 | 8.7 | 5.0 | 3.8 | 0.7 |
| 137147 | 71 | 283 | 51 | 47.5 | 55 | 145 | 49 | 136 | 3.6 | 10.1 | 26.5 | 84.2 | 59.0 | 13.1 | 2.5 | 10.4 | 10.1 | 6.1 | 4.7 | 0.4 |
| 146798 | 72 | 245 | 56 | 40.1 | 60 | 152 | 45 | 127 | 2.8 | 7.0 | 24.5 | 70.4 | 45.2 | 16.8 | 2.6 | 11.8 | 8.7 | 3.9 | 4.5 | 0.6 |
| 148557 | 78 | 241 | 82 | 47.9 | 49 | 158 | 43 | 121 | 2.4 | 5.2 | 23.4 | 72.7 | 64.8 | 16.8 | 2.3 | 11.2 | 8.6 | 4.5 | 4.5 | 0.5 |
| 152942 | 89 | 200 | 146 | 48.2 | 67 | 162 | 42 | 110 | 1.6 | 3.1 | 21.1 | 64.3 | 44.0 | 13.2 | 1.8 | 11.9 | 8.7 | 4.4 | 4.2 | 0.4 |
| 157332 | 88 | 235 | 133 | 40.3 | 84 | 161 | 37 | 106 | 1.3 | 1.9 | 20.5 | 60.6 | 42.1 | 14.2 | 2.0 | 10.0 | 6.3 | 3.7 | 3.2 | 0.4 |
| 154052 | 91 | 240 | 179 | 38.5 | 59 | 152 | 33 | 92 | 0.9 | 1.2 | 16.9 | 52.9 | 40.1 | 11.0 | 1.8 | 8.7 | 6.7 | 3.7 | 2.4 | 0.3 |
| 155151 | 83 | 194 | 186 | 47.2 | 68 | 155 | 31 | 81 | 0.7 | 1.0 | 15.1 | 47.9 | 36.2 | 8.9 | 2.4 | 6.0 | 5.1 | 2.9 | 3.0 | 0.4 |
| 164019 | 99 | 238 | 282 | 47.8 | 63 | 164 | 29 | 84 | 0.6 | 0.7 | 14.7 | 47.0 | 34.6 | 10.0 | 1.9 | 7.4 | 6.4 | 2.9 | 3.3 | 0.3 |
| 152153 | 102 | 209 | 328 | 41.3 | 66 | 157 | 26 | 72 | 0.7 | 0.8 | 16.3 | 47.3 | 33.6 | 9.7 | 1.4 | 8.0 | 5.8 | 2.8 | 2.4 | 0.3 |
| 157736 | 98 | 199 | 187 | 40.8 | 72 | 154 | 26 | 82 | 0.7 | 0.8 | 14.7 | 42.5 | 41.8 | 7.5 | 2.2 | 6.7 | 6.2 | 2.4 | 2.9 | 0.4 |
| 163093 | 111 | 188 | 230 | 43.8 | 80 | 159 | 25 | 75 | 0.8 | 0.9 | 14.4 | 43.1 | 35.1 | 9.2 | 1.8 | 7.3 | 5.8 | 1.7 | 2.5 | 0.2 |
| 169877 | 104 | 212 | 348 | 37.3 | 71 | 162 | 26 | 86 | 0.7 | 2.2 | 15.0 | 42.5 | 29.8 | 9.6 | 1.5 | 9.4 | 4.8 | 2.8 | 2.0 | 0.3 |
| 168572 | 113 | 224 | 430 | 39.6 | 71 | 166 | 27 | 88 | 0.9 | 4.0 | 13.1 | 39.2 | 36.1 | 10.1 | 1.7 | 8.4 | 6.1 | 1.8 | 3.1 | 0.3 |
| 167365 | 110 | 186 | 494 | 43.7 | 98 | 170 | 23 | 85 | 0.9 | 5.6 | 12.5 | 39.6 | 28.3 | 8.1 | 1.6 | 6.7 | 3.5 | 2.8 | 2.2 | 0.3 |
| 143084 | 108 | 191 | 476 | 35.4 | 91 | 159 | 21 | 75 | 0.9 | 6.7 | 10.5 | 33.8 | 24.8 | 5.5 | 1.3 | 5.9 | 3.7 | 2.2 | 3.1 | 0.3 |
| 161963 | 112 | 170 | 530 | 38.7 | 72 | 156 | 20 | 72 | 0.8 | 6.3 | 10.8 | 35.0 | 27.6 | 5.4 | 1.8 | 7.5 | 3.3 | 2.6 | 1.7 | 0.3 |
| 152103 | 103 | 170 | 575 | 39.2 | 67 | 148 | 19 | 62 | 0.8 | 5.7 | 10.6 | 35.5 | 24.8 | 7.6 | 1.2 | 5.7 | 3.8 | 1.9 | 2.3 | 0.2 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 158881 | 114 | 182 | 797 | 36.0 | 89 | 159 | 23 | 67 | 0.6 | 4.7 | 13.1 | 36.6 | 25.0 | 10.0 | 1.9 | 7.2 | 5.7 | 2.8 | 1.3 | 0.3 |
| 162427 | 102 | 169 | 477 | 38.0 | 74 | 152 | 21 | 66 | 0.7 | 3.0 | 12.2 | 40.0 | 30.7 | 6.8 | 1.5 | 6.4 | 5.3 | 2.4 | 1.9 | 0.1 |
| 177366 | 108 | 187 | 626 | 41.8 | 80 | 147 | 24 | 77 | 0.6 | 1.8 | 14.4 | 46.3 | 33.2 | 8.8 | 1.8 | 7.2 | 6.4 | 2.9 | 2.7 | 0.3 |
| 158501 | 108 | 204 | 582 | 46.5 | 77 | 153 | 24 | 79 | 0.7 | 1.2 | 14.6 | 45.8 | 42.4 | 12.1 | 2.0 | 9.3 | 6.8 | 3.2 | 3.2 | 0.4 |
| 172884 | 106 | 212 | 458 | 44.4 | 78 | 152 | 32 | 92 | 0.6 | 0.8 | 16.4 | 50.7 | 43.8 | 12.8 | 2.3 | 10.0 | 8.3 | 3.2 | 3.7 | 0.5 |
| 165174 | 102 | 238 | 676 | 40.2 | 76 | 162 | 35 | 106 | 0.7 | 1.1 | 19.7 | 58.3 | 42.1 | 10.8 | 1.8 | 10.4 | 8.1 | 3.6 | 2.8 | 0.6 |
| 156367 | 100 | 232 | 429 | 43.2 | 66 | 156 | 35 | 110 | 0.7 | 0.9 | 18.4 | 59.4 | 52.4 | 10.7 | 2.7 | 11.1 | 8.0 | 3.4 | 2.7 | 0.5 |
| 150371 | 96 | 252 | 208 | 38.3 | 89 | 156 | 35 | 119 | 0.5 | 1.0 | 20.4 | 65.4 | 52.9 | 12.8 | 1.8 | 11.1 | 8.1 | 3.8 | 3.9 | 0.6 |
| 148133 | 96 | 252 | 195 | 49.6 | 72 | 153 | 32 | 123 | 0.6 | 0.6 | 17.5 | 62.8 | 56.3 | 12.2 | 2.2 | 9.2 | 7.1 | 4.7 | 3.2 | 0.4 |
| 151672 | 90 | 288 | 141 | 44.9 | 76 | 157 | 39 | 113 | 0.8 | 0.7 | 23.9 | 63.7 | 59.2 | 12.1 | 2.0 | 8.9 | 9.5 | 5.2 | 4.5 | 0.4 |
| 167518 | 98 | 279 | 154 | 44.2 | 90 | 171 | 41 | 136 | 0.7 | 0.8 | 19.5 | 74.1 | 55.8 | 13.5 | 2.8 | 13.2 | 9.4 | 4.6 | 4.3 | 0.9 |
| 173997 | 104 | 321 | 159 | 48.5 | 90 | 165 | 43 | 127 | 0.9 | 0.7 | 22.4 | 70.9 | 54.8 | 12.6 | 2.5 | 11.4 | 7.9 | 5.0 | 3.3 | 0.4 |
| PCLava2track3 | | | | | | | | | | | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 43101 | 12 | 61 | <LOD | 6.7 | 7 | 783 | 23 | 172 | 19.7 | #### | 32.8 | 67.7 | 36.1 | 6.3 | 1.0 | 4.1 | 4.5 | 2.2 | 3.8 | 0.4 |
| 45688 | 17 | 73 | 20 | 11.7 | 6 | 730 | 27 | 162 | 14.7 | 980.2 | 32.2 | 64.5 | 34.8 | 7.4 | 1.1 | 5.8 | 5.0 | 2.8 | 1.6 | 0.2 |
| 56119 | 20 | 95 | 46 | 17.5 | 19 | 728 | 26 | 143 | 13.6 | 962.2 | 32.5 | 69.7 | 32.6 | 6.4 | 1.7 | 7.1 | 3.4 | 2.3 | 2.5 | 0.7 |
| 68880 | 31 | 111 | 67 | 24.6 | 21 | 743 | 31 | 132 | 11.4 | 952.5 | 29.9 | 67.9 | 40.3 | 9.9 | 1.4 | 7.3 | 6.3 | 2.7 | 2.1 | 0.5 |
| 87653 | 37 | 133 | 52 | 26.9 | 19 | 690 | 29 | 137 | 9.0 | 794.1 | 28.3 | 71.3 | 43.1 | 8.6 | 2.1 | 6.3 | 7.8 | 2.4 | 3.4 | 0.3 |
| 70925 | 35 | 121 | 88 | 23.7 | 29 | 469 | 23 | 87 | 5.0 | 528.1 | 22.6 | 56.0 | 29.0 | 6.1 | 1.3 | 7.1 | 6.2 | 2.2 | 1.9 | 0.4 |
| 105270 | 58 | 185 | 133 | 25.6 | 39 | 627 | 34 | 110 | 6.3 | 584.3 | 30.2 | 74.6 | 41.5 | 11.0 | 2.1 | 8.6 | 7.1 | 3.3 | 3.8 | 0.4 |
| 118909 | 62 | 175 | 112 | 34.0 | 64 | 462 | 32 | 109 | 5.7 | 490.0 | 24.5 | 68.8 | 42.1 | 8.7 | 2.1 | 7.9 | 11.3 | 4.5 | 3.6 | 0.4 |
| 130941 | 70 | 204 | 92 | 36.3 | 47 | 390 | 35 | 111 | 4.1 | 399.9 | 25.2 | 70.3 | 53.5 | 10.0 | 1.4 | 10.4 | 6.9 | 4.0 | 3.7 | 0.3 |
| 144563 | 79 | 200 | 146 | 41.0 | 71 | 359 | 37 | 107 | 2.9 | 320.1 | 23.0 | 65.4 | 43.4 | 11.7 | 2.4 | 9.0 | 8.3 | 3.7 | 3.6 | 0.9 |
| 125218 | 92 | 188 | 219 | 41.1 | 61 | 356 | 34 | 111 | 2.0 | 233.3 | 22.1 | 64.5 | 43.1 | 12.6 | 2.0 | 10.4 | 7.4 | 4.7 | 3.0 | 0.5 |
| 160814 | 97 | 238 | 172 | 41.6 | 74 | 297 | 37 | 99 | 1.3 | 197.8 | 20.9 | 74.2 | 49.6 | 11.4 | 2.5 | 11.8 | 8.8 | 3.1 | 2.6 | 0.6 |
| 151364 | 88 | 224 | 263 | 38.5 | 72 | 283 | 38 | 95 | 1.1 | 140.6 | 21.6 | 60.4 | 54.3 | 13.9 | 2.4 | 11.1 | 9.0 | 3.6 | 2.8 | 0.3 |
| 157305 | 105 | 246 | 202 | 41.0 | 86 | 259 | 35 | 106 | 1.1 | 103.3 | 19.9 | 65.0 | 42.9 | 10.2 | 2.3 | 8.5 | 8.6 | 3.7 | 2.7 | 0.3 |
| 165748 | 83 | 233 | 285 | 45.6 | 89 | 232 | 36 | 103 | 1.0 | 72.1 | 20.5 | 58.2 | 41.0 | 12.9 | 2.3 | 12.3 | 7.3 | 3.7 | 2.2 | 0.4 |
| 146556 | 98 | 229 | 226 | 45.2 | 69 | 217 | 33 | 97 | 0.9 | 49.1 | 20.5 | 59.0 | 55.4 | 11.1 | 2.5 | 7.6 | 6.3 | 2.9 | 1.7 | 0.5 |
| 143486 | 89 | 177 | 275 | 41.4 | 63 | 190 | 31 | 79 | 0.6 | 29.6 | 18.5 | 53.8 | 38.8 | 8.7 | 2.2 | 9.1 | 5.5 | 2.6 | 3.0 | 0.3 |
| 159321 | 102 | 186 | 298 | 39.5 | 114 | 198 | 29 | 87 | 0.5 | 21.1 | 17.9 | 55.5 | 37.4 | 10.6 | 1.9 | 9.5 | 5.9 | 2.9 | 2.1 | 0.3 |
| 156849 | 104 | 228 | 344 | 45.3 | 74 | 183 | 31 | 81 | 0.4 | 14.7 | 15.5 | 50.1 | 36.8 | 9.6 | 2.0 | 10.0 | 6.4 | 2.0 | 3.5 | 0.5 |
| 168668 | 101 | 204 | 341 | 43.2 | 80 | 172 | 28 | 76 | 0.6 | 11.0 | 14.9 | 48.8 | 36.1 | 10.6 | 2.0 | 6.8 | 7.4 | 4.4 | 2.5 | 0.3 |
| 164982 | 101 | 222 | 426 | 41.2 | 71 | 158 | 25 | 83 | 0.3 | 6.8 | 14.9 | 46.0 | 30.8 | 10.4 | 1.7 | 8.3 | 5.7 | 2.7 | 2.7 | 0.4 |
| 152837 | 104 | 190 | 540 | 35.0 | 65 | 162 | 24 | 71 | 0.3 | 5.5 | 14.4 | 43.7 | 36.8 | 8.5 | 2.2 | 5.9 | 4.1 | 2.4 | 2.2 | 0.3 |
| 168483 | 110 | 184 | 272 | 42.5 | 79 | 170 | 27 | 84 | 0.5 | 4.8 | 14.0 | 46.8 | 38.5 | 8.3 | 2.3 | 9.0 | 5.8 | 2.3 | 1.6 | 0.5 |
| 166572 | 120 | 190 | 352 | 42.8 | 87 | 171 | 26 | 76 | 0.5 | 4.6 | 14.9 | 46.7 | 38.1 | 8.1 | 1.8 | 7.5 | 6.8 | 3.0 | 1.9 | 0.2 |
| 150826 | 101 | 208 | 472 | 44.0 | 91 | 170 | 26 | 79 | 0.5 | 3.9 | 16.3 | 49.5 | 30.9 | 11.2 | 1.7 | 7.3 | 4.7 | 3.2 | 2.6 | 0.3 |
| 157807 | 106 | 198 | 577 | 40.9 | 90 | 171 | 28 | 85 | 0.5 | 4.0 | 14.0 | 46.2 | 30.6 | 9.2 | 2.2 | 7.8 | 7.2 | 2.5 | 1.6 | 0.2 |
| 184908 | 115 | 210 | 575 | 48.1 | 88 | 173 | 26 | 87 | 0.5 | 3.9 | 16.2 | 51.5 | 43.0 | 11.4 | 1.6 | 9.3 | 5.1 | 3.7 | 2.1 | 0.3 |
| 152763 | 96 | 229 | 472 | 37.2 | 68 | 171 | 30 | 90 | 0.6 | 4.0 | 15.3 | 48.5 | 43.1 | 8.6 | 1.8 | 9.6 | 5.7 | 2.6 | 2.2 | 0.3 |
| 175821 | 102 | 208 | 377 | 42.2 | 97 | 167 | 34 | 89 | 0.6 | 3.4 | 17.7 | 52.6 | 39.9 | 10.2 | 1.8 | 8.7 | 5.6 | 4.0 | 3.0 | 0.4 |
| 154242 | 91 | 226 | 396 | 38.8 | 62 | 163 | 28 | 88 | 0.6 | 3.1 | 16.7 | 54.6 | 37.8 | 8.1 | 2.1 | 8.9 | 6.5 | 2.8 | 2.8 | 0.4 |
| 163713 | 107 | 226 | 459 | 47.8 | 72 | 182 | 35 | 105 | 0.6 | 3.4 | 17.9 | 57.7 | 45.3 | 14.2 | 2.2 | 11.0 | 8.5 | 3.9 | 2.7 | 0.4 |
| 179725 | 98 | 224 | 315 | 40.0 | 83 | 181 | 33 | 102 | 0.5 | 2.9 | 18.2 | 62.1 | 47.2 | 10.2 | 2.7 | 9.4 | 7.7 | 4.9 | 1.7 | 0.4 |
| 158631 | 101 | 227 | 273 | 41.9 | 93 | 164 | 33 | 103 | 0.5 | 2.6 | 18.0 | 63.0 | 42.7 | 12.7 | 2.2 | 8.6 | 7.4 | 3.9 | 1.7 | 0.6 |
| 154974 | 94 | 221 | 330 | 42.0 | 82 | 161 | 32 | 89 | 0.4 | 2.4 | 18.2 | 52.3 | 39.7 | 11.0 | 2.2 | 9.2 | 7.7 | 3.8 | 2.5 | 0.5 |
| 160097 | 101 | 224 | 272 | 41.5 | 73 | 166 | 33 | 100 | 0.6 | 2.7 | 17.6 | 55.8 | 38.7 | 13.9 | 2.4 | 10.3 | 6.7 | 4.7 | 4.1 | 0.3 |
| 179512 | 109 | 234 | 531 | 46.6 | 80 | 184 | 37 | 117 | 0.5 | 2.7 | 19.3 | 61.0 | 44.8 | 11.7 | 1.8 | 11.3 | 8.0 | 4.6 | 1.7 | 0.5 |
| 155229 | 112 | 252 | 368 | 48.2 | 69 | 176 | 33 | 99 | 0.6 | 3.0 | 19.0 | 61.6 | 46.2 | 11.9 | 2.5 | 7.8 | 6.9 | 4.5 | 3.3 | 0.6 |
| 149848 | 97 | 223 | 183 | 43.6 | 99 | 167 | 32 | 103 | 0.4 | 2.7 | 17.0 | 58.3 | 44.2 | 10.2 | 1.8 | 8.4 | 7.6 | 3.5 | 3.1 | 0.3 |
| 144542 | 95 | 200 | 225 | 37.0 | 80 | 164 | 28 | 97 | 0.6 | 2.7 | 14.9 | 54.4 | 40.3 | 8.2 | 2.4 | 9.3 | 7.1 | 2.5 | 1.1 | 0.3 |
| 167338 | 98 | 259 | 158 | 43.9 | 89 | 164 | 33 | 111 | 0.6 | 3.4 | 19.1 | 59.5 | 51.9 | 12.6 | 2.0 | 9.4 | 5.6 | 4.7 | 3.4 | 0.4 |
| 170556 | 105 | 270 | 201 | 42.0 | 78 | 188 | 38 | 105 | 0.6 | 3.3 | 18.4 | 63.5 | 50.8 | 12.0 | 2.8 | 13.0 | 9.2 | 3.7 | 2.7 | 0.4 |
| 156601 | 100 | 282 | 220 | 43.5 | 72 | 164 | 36 | 105 | 0.5 | 2.5 | 18.2 | 60.6 | 53.5 | 11.4 | 2.7 | 11.4 | 7.6 | 4.0 | 3.4 | 0.4 |
| 157461 | 98 | 252 | 256 | 45.6 | 71 | 163 | 39 | 120 | 0.5 | 2.8 | 19.7 | 61.4 | 50.4 | 8.8 | 2.2 | 11.7 | 8.0 | 5.0 | 4.0 | 0.4 |
| 169296 | 94 | 237 | 197 | 40.5 | 80 | 179 | 36 | 119 | 0.6 | 3.1 | 20.2 | 63.9 | 50.4 | 9.7 | 1.9 | 12.1 | 7.7 | 2.6 | 2.7 | 0.6 |
| 170327 | 104 | 271 | 146 | 49.4 | 104 | 176 | 38 | 121 | 0.8 | 3.0 | 20.7 | 67.3 | 52.1 | 13.9 | 2.6 | 12.7 | 7.6 | 3.8 | 3.0 | 0.5 |
| 162404 | 106 | 237 | 193 | 43.7 | 73 | 183 | 40 | 125 | 0.8 | 3.1 | 17.7 | 62.7 | 48.3 | 12.6 | 1.9 | 9.9 | 9.0 | 4.8 | 2.9 | 0.6 |
| 152736 | 94 | 266 | 247 | 44.5 | 70 | 173 | 36 | 103 | 0.6 | 2.8 | 18.2 | 64.2 | 53.5 | 11.0 | 2.4 | 9.0 | 7.7 | 3.5 | 3.0 | 0.4 |
| 159796 | 98 | 246 | 252 | 44.5 | 59 | 167 | 36 | 107 | 0.6 | 2.6 | 20.9 | 62.8 | 40.4 | 15.6 | 2.6 | 10.5 | 7.9 | 3.0 | 3.3 | 0.4 |
| 155722 | 104 | 265 | 281 | 48.8 | 71 | 180 | 40 | 120 | 0.7 | 2.7 | 21.5 | 68.0 | 42.5 | 10.3 | 2.5 | 10.5 | 8.1 | 4.0 | 2.7 | 0.6 |
| 149682 | 103 | 242 | 262 | 44.1 | 83 | 165 | 36 | 110 | 0.6 | 3.0 | 19.8 | 59.1 | 42.9 | 14.6 | 2.5 | 9.6 | 8.8 | 4.4 | 2.1 | 0.5 |
| 152280 | 90 | 227 | 222 | 44.0 | 73 | 171 | 36 | 116 | 0.7 | 3.1 | 19.2 | 62.9 | 46.1 | 9.2 | 1.9 | 10.1 | 5.6 | 3.1 | 2.9 | 0.5 |
| 152837 | 104 | 240 | 527 | 50.6 | 106 | 175 | 38 | 112 | 0.7 | 2.7 | 18.9 | 61.3 | 50.2 | 9.7 | 2.4 | 9.6 | 5.6 | 4.0 | 4.7 | 0.3 |
| 168010 | 104 | 279 | 323 | 42.9 | 86 | 188 | 34 | 112 | 0.8 | 2.3 | 20.4 | 63.0 | 52.5 | 14.4 | 2.5 | 9.6 | 7.4 | 3.2 | 3.5 | 0.5 |
| 159486 | 106 | 289 | 409 | 40.4 | 77 | 171 | 36 | 118 | 0.8 | 2.5 | 17.8 | 64.7 | 45.6 | 12.2 | 2.3 | 9.9 | 6.3 | 4.1 | 2.0 | 0.2 |
| 161679 | 109 | 255 | 357 | 46.7 | 82 | 197 | 35 | 117 | 0.8 | 2.1 | 17.9 | 58.6 | 50.9 | 11.2 | 2.5 | 11.2 | 7.5 | 4.0 | 3.1 | 0.3 |

| AT2.1.1track1 | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 39622 | 14.2 | 87.5 | <LOD | 15.1 | 7.6 | 333.9 | 22.7 | 200.6 | 22.8 | 437.5 | 53.8 | 105.4 | 41.8 | 7.0 | 1.3 | 5.8 | 5.5 | 3.5 | 2.7 | 0.3 |
| 52359 | 16.1 | 111.0 | <LOD | 16.9 | 11.8 | 358.3 | 23.0 | 185.2 | 22.1 | 474.3 | 54.6 | 96.8 | 43.5 | 12.8 | 1.4 | 6.3 | 6.4 | 2.4 | 2.4 | 0.4 |
| 52979 | 22.5 | 143.2 | <LOD | 20.7 | 17.1 | 386.5 | 26.8 | 183.4 | 20.5 | 460.6 | 46.6 | 103.0 | 40.7 | 9.0 | 1.8 | 8.7 | 5.9 | 3.4 | 2.8 | 0.3 |
| 65471 | 25.1 | 145.5 | <LOD | 22.2 | 17.3 | 370.3 | 28.8 | 167.2 | 16.0 | 412.2 | 47.3 | 93.4 | 40.1 | 12.5 | 1.5 | 7.0 | 4.7 | 2.3 | 3.8 | 0.4 |
| 81062 | 28.9 | 157.8 | <LOD | 24.6 | 24.4 | 338.9 | 32.7 | 154.0 | 14.9 | 381.5 | 42.3 | 82.5 | 38.3 | 8.7 | 1.9 | 8.3 | 7.1 | 3.0 | 2.0 | 0.3 |
| 98054 | 43.4 | 222.0 | <LOD | 33.4 | 38.9 | 317.4 | 32.2 | 169.9 | 12.1 | 301.5 | 38.8 | 84.6 | 40.6 | 10.6 | 2.5 | 9.2 | 8.1 | 3.5 | 3.4 | 0.5 |
| 121080 | 48.2 | 195.2 | <LOD | 35.9 | 31.8 | 282.3 | 38.7 | 166.4 | 9.8 | 234.7 | 35.1 | 82.8 | 48.6 | 13.9 | 2.3 | 7.6 | 7.6 | 4.3 | 4.6 | 0.4 |
| 124857 | 55.7 | 226.2 | <LOD | 39.1 | 48.7 | 245.5 | 34.9 | 164.8 | 7.8 | 160.7 | 32.4 | 79.7 | 51.6 | 14.6 | 1.9 | 8.3 | 8.1 | 4.7 | 3.5 | 0.4 |
| 123398 | 61.3 | 238.0 | <LOD | 33.5 | 61.3 | 214.1 | 34.7 | 154.7 | 5.7 | 113.3 | 33.4 | 82.1 | 57.9 | 13.5 | 1.8 | 14.6 | 8.2 | 4.6 | 4.6 | 0.3 |
| 145020 | 71.5 | 221.6 | 26.7 | 40.2 | 48.9 | 212.4 | 34.1 | 148.6 | 4.7 | 79.0 | 25.4 | 69.8 | 46.7 | 11.3 | 2.4 | 11.1 | 5.5 | 3.3 | 3.7 | 0.4 |
| 160618 | 78.5 | 284.7 | 71.5 | 43.8 | 81.9 | 216.2 | 41.6 | 139.0 | 3.2 | 56.7 | 24.9 | 67.9 | 46.4 | 14.4 | 2.2 | 9.1 | 9.3 | 3.3 | 5.2 | 0.3 |
| 139251 | 69.7 | 228.0 | 68.7 | 44.7 | 45.0 | 180.0 | 36.0 | 136.6 | 2.4 | 33.5 | 19.7 | 58.1 | 46.0 | 11.7 | 1.9 | 9.7 | 7.4 | 3.6 | 3.1 | 0.4 |
| 149800 | 78.0 | 238.2 | 80.6 | 48.8 | 78.2 | 179.2 | 35.1 | 130.7 | 1.8 | 27.1 | 22.1 | 69.9 | 48.3 | 10.8 | 2.3 | 9.3 | 8.7 | 3.5 | 3.2 | 0.6 |
| 154627 | 87.5 | 256.2 | 102.1 | 44.5 | 91.6 | 191.0 | 39.1 | 127.3 | 1.6 | 20.1 | 19.8 | 67.8 | 50.4 | 12.6 | 1.9 | 8.0 | 9.0 | 3.8 | 2.3 | 0.5 |
| 147440 | 82.4 | 212.9 | 88.4 | 34.2 | 60.6 | 153.2 | 35.2 | 104.6 | 1.1 | 13.0 | 17.4 | 52.3 | 43.0 | 10.6 | 3.1 | 7.3 | 7.8 | 4.6 | 3.8 | 0.5 |
| 168751 | 77.1 | 261.2 | 102.7 | 42.9 | 44.3 | 158.7 | 36.7 | 101.9 | 0.8 | 10.6 | 18.7 | 57.4 | 44.4 | 12.3 | 2.2 | 7.8 | 8.0 | 3.3 | 3.8 | 0.6 |
| 162207 | 88.4 | 309.9 | 130.0 | 50.2 | 59.6 | 177.2 | 42.0 | 97.9 | 0.9 | 8.0 | 20.7 | 64.4 | 51.4 | 13.3 | 2.6 | 9.1 | 8.0 | 4.8 | 3.1 | 0.6 |
| 161448 | 90.4 | 275.4 | 93.0 | 38.2 | 81.4 | 157.4 | 38.2 | 98.0 | 0.6 | 6.2 | 19.2 | 57.6 | 52.5 | 13.7 | 2.5 | 8.7 | 6.5 | 3.8 | 2.9 | 0.8 |
| 166819 | 92.2 | 288.9 | 170.9 | 52.5 | 42.6 | 172.0 | 39.2 | 84.7 | 0.5 | 5.9 | 19.5 | 64.5 | 45.5 | 11.3 | 2.2 | 11.6 | 8.4 | 4.1 | 4.9 | 0.5 |
| 145335 | 89.2 | 265.4 | 143.7 | 39.3 | 108.3 | 158.6 | 31.9 | 87.6 | 0.5 | 4.5 | 18.0 | 58.5 | 52.1 | 14.3 | 1.8 | 8.4 | 8.0 | 4.9 | 2.9 | 0.5 |
| 143590 | 86.0 | 277.2 | 90.6 | 50.2 | 59.4 | 150.7 | 37.0 | 86.8 | 0.3 | 4.5 | 17.1 | 60.4 | 56.7 | 11.1 | 1.9 | 11.1 | 7.4 | 4.0 | 2.1 | 0.5 |
| 178043 | 98.7 | 304.1 | 112.6 | 48.8 | 70.2 | 176.6 | 40.4 | 91.2 | 0.6 | 4.5 | 20.2 | 64.0 | 54.7 | 12.2 | 2.3 | 12.1 | 10.0 | 3.7 | 2.7 | 0.8 |
| 173374 | 89.0 | 275.9 | 111.7 | 65.1 | 55.9 | 169.2 | 42.6 | 92.7 | 0.5 | 4.2 | 16.7 | 60.2 | 42.2 | 15.0 | 2.6 | 9.8 | 7.5 | 3.2 | 3.4 | 0.6 |
| 153022 | 90.0 | 258.4 | 45.9 | 44.5 | 54.2 | 143.4 | 43.6 | 88.4 | 0.4 | 4.4 | 19.4 | 63.4 | 63.2 | 9.4 | 2.5 | 10.4 | 8.8 | 3.3 | 4.4 | 0.7 |
| 157608 | 85.8 | 313.5 | 44.9 | 51.7 | 49.2 | 159.0 | 47.7 | 99.7 | 0.4 | 3.9 | 18.8 | 66.7 | 54.7 | 12.4 | 2.4 | 12.7 | 7.9 | 5.1 | 4.1 | 0.6 |
| 170601 | 81.7 | 259.0 | 41.1 | 47.6 | 33.2 | 147.5 | 38.7 | 100.0 | 0.5 | 3.6 | 21.0 | 71.6 | 56.7 | 11.2 | 2.2 | 10.1 | 10.2 | 5.0 | 4.5 | 0.7 |
| 161753 | 78.7 | 271.1 | 48.9 | 50.7 | 84.4 | 167.1 | 45.3 | 94.5 | 0.6 | 3.6 | 19.6 | 71.6 | 51.6 | 12.7 | 1.8 | 9.9 | 10.1 | 4.0 | 3.6 | 0.5 |
| 176786 | 82.1 | 254.0 | 59.5 | 54.1 | 56.8 | 140.9 | 44.2 | 88.4 | 0.5 | 3.4 | 22.7 | 63.1 | 48.0 | 12.9 | 2.7 | 10.2 | 9.6 | 4.3 | 5.1 | 0.5 |
| 156729 | 86.4 | 333.4 | 20.3 | 52.4 | 62.5 | 152.9 | 40.2 | 88.3 | 0.4 | 3.3 | 25.4 | 64.0 | 46.5 | 17.0 | 2.3 | 11.7 | 10.2 | 4.7 | 3.6 | 0.7 |
| 152541 | 80.4 | 282.1 | 31.3 | 61.8 | 69.0 | 145.6 | 45.3 | 94.7 | 0.4 | 3.3 | 20.6 | 65.7 | 61.2 | 14.0 | 1.7 | 10.0 | 8.4 | 4.1 | 3.9 | 0.4 |
| 149770 | 89.3 | 268.0 | 58.1 | 42.0 | 64.9 | 149.8 | 40.0 | 115.1 | 0.6 | 3.2 | 19.4 | 69.2 | 54.6 | 15.6 | 1.9 | 11.2 | 8.7 | 5.0 | 3.8 | 0.7 |
| 177936 | 100.8 | 287.2 | 226.6 | 53.0 | 56.9 | 156.7 | 42.1 | 103.2 | 0.5 | 2.8 | 20.3 | 64.8 | 59.3 | 13.2 | 2.5 | 10.1 | 11.3 | 4.8 | 3.5 | 0.5 |
| 157914 | 81.5 | 235.0 | 160.4 | 47.2 | 50.7 | 138.7 | 38.9 | 77.8 | 0.5 | 2.9 | 19.1 | 58.1 | 42.9 | 12.1 | 1.8 | 9.9 | 6.7 | 4.4 | 3.5 | 0.5 |
| 146275 | 77.6 | 243.0 | 422.4 | 47.4 | 63.9 | 131.0 | 43.9 | 80.0 | 0.4 | 2.8 | 17.4 | 57.5 | 43.4 | 9.7 | 2.3 | 12.9 | 6.9 | 3.8 | 2.7 | 0.5 |
| 169816 | 83.4 | 263.8 | 273.9 | 41.6 | 77.4 | 146.9 | 34.5 | 73.2 | 0.4 | 2.9 | 15.6 | 53.0 | 37.2 | 13.8 | 1.8 | 9.8 | 8.7 | 4.0 | 2.8 | 0.4 |
| 133692 | 88.2 | 234.9 | 506.9 | 43.0 | 100.3 | 137.5 | 35.4 | 80.8 | 0.5 | 3.3 | 16.0 | 47.0 | 44.5 | 10.6 | 1.6 | 8.7 | 4.6 | 3.6 | 3.3 | 0.4 |
| 154278 | 96.1 | 207.7 | 315.3 | 41.0 | 52.5 | 141.0 | 26.3 | 67.7 | 0.3 | 2.6 | 15.9 | 48.9 | 36.4 | 10.5 | 1.8 | 8.3 | 4.3 | 2.3 | 2.5 | 0.6 |
| 165260 | 88.6 | 215.7 | 913.4 | 42.9 | 56.2 | 127.3 | 25.1 | 59.8 | 0.4 | 2.9 | 12.4 | 48.0 | 40.5 | 10.9 | 1.5 | 7.8 | 6.7 | 3.3 | 2.6 | 0.4 |
| 165645 | 97.9 | 195.8 | 496.4 | 37.3 | 62.5 | 151.4 | 22.9 | 59.5 | 0.3 | 2.5 | 13.5 | 45.3 | 31.2 | 8.3 | 1.3 | 6.4 | 5.7 | 3.4 | 2.7 | 0.4 |
| 169805 | 87.1 | 174.4 | 412.2 | 46.0 | 65.5 | 137.2 | 26.6 | 52.4 | 0.4 | 2.5 | 12.8 | 38.0 | 29.0 | 9.3 | 1.4 | 6.4 | 5.6 | 2.5 | 2.5 | 0.3 |
| 164617 | 102.6 | 190.8 | 461.6 | 43.1 | 60.1 | 142.4 | 21.8 | 53.9 | 0.3 | 2.4 | 10.5 | 37.9 | 29.5 | 6.8 | 1.2 | 5.2 | 3.6 | 2.2 | 1.7 | 0.2 |
| 170041 | 95.1 | 147.4 | 598.7 | 34.9 | 67.8 | 137.8 | 22.1 | 46.6 | 0.3 | 2.3 | 8.1 | 31.0 | 25.8 | 7.0 | 1.6 | 4.4 | 3.8 | 1.4 | 1.4 | 0.1 |
| 183422 | 107.2 | 104.3 | 591.1 | 38.2 | 82.7 | 143.9 | 21.3 | 44.3 | 0.3 | 2.3 | 10.5 | 30.5 | 24.2 | 6.4 | 1.4 | 5.6 | 4.5 | 1.1 | 1.7 | 0.2 |
| 152810 | 98.0 | 140.1 | 467.5 | 26.8 | 65.5 | 135.4 | 16.5 | 47.0 | 0.2 | 2.0 | 7.4 | 24.9 | 20.9 | 6.0 | 1.8 | 6.0 | 2.8 | 1.3 | 1.1 | 0.2 |
| 150904 | 101.5 | 118.3 | 862.2 | 32.2 | 78.0 | 141.5 | 15.4 | 41.2 | 0.2 | 2.1 | 7.6 | 21.7 | 19.7 | 5.6 | 1.0 | 3.4 | 3.4 | 1.4 | 0.8 | <LOD |
| 170583 | 113.2 | 153.0 | 794.0 | 40.0 | 91.0 | 140.8 | 15.2 | 48.9 | 0.3 | 2.3 | 8.3 | 23.9 | 20.0 | 6.9 | 1.5 | 3.7 | 2.8 | 1.7 | 1.2 | <LOD |
| 168820 | 105.2 | 176.6 | 1263.1 | 33.8 | 60.8 | 129.7 | 14.5 | 43.1 | 0.2 | 1.9 | 7.9 | 22.0 | 20.8 | 5.3 | 1.5 | 5.3 | 3.1 | 1.1 | 1.7 | 0.2 |
| 153521 | 102.8 | 131.6 | 562.4 | 38.9 | 77.7 | 130.5 | 12.8 | 36.4 | 0.2 | 1.6 | 6.4 | 23.5 | 16.8 | 4.0 | 0.9 | 2.8 | 2.4 | 1.3 | 1.7 | 0.2 |
| 159312 | 118.3 | 128.1 | 932.2 | 37.6 | 92.1 | 144.5 | 13.1 | 41.3 | 0.2 | 1.6 | 6.2 | 20.1 | 18.9 | 5.5 | 1.1 | 3.8 | 2.3 | 1.8 | 1.1 | 0.2 |
| 158515 | 128.1 | 130.4 | 737.2 | 37.5 | 119.7 | 139.2 | 13.4 | 43.2 | 0.2 | 1.4 | 6.7 | 19.7 | 17.5 | 4.7 | 1.1 | 3.0 | 3.3 | 1.3 | 0.5 | 0.2 |
| 165958 | 122.3 | 142.2 | 504.4 | 36.2 | 108.7 | 128.5 | 12.7 | 41.0 | 0.3 | 1.4 | 4.5 | 16.1 | 14.6 | 5.4 | 0.9 | 3.8 | 1.6 | 1.2 | 1.0 | <LOD |
| 151510 | 127.2 | 128.4 | 515.2 | 29.7 | 69.1 | 128.5 | 10.1 | 46.4 | 0.2 | 1.4 | 5.2 | 19.3 | 23.9 | 6.0 | 1.0 | 2.7 | 2.2 | 1.0 | 1.1 | 0.1 |
| 166178 | 126.7 | 128.3 | 700.7 | 31.3 | 74.9 | 145.9 | 11.2 | 40.7 | 0.2 | 1.3 | 5.1 | 16.9 | 14.6 | 4.8 | 0.9 | 2.7 | 3.0 | 1.3 | 0.8 | <LOD |
| 163883 | 127.8 | 115.1 | 717.3 | 32.9 | 63.9 | 138.4 | 12.2 | 42.3 | 0.2 | 1.0 | 5.3 | 13.8 | 15.8 | 4.0 | 0.8 | 3.4 | 2.9 | 1.1 | 0.7 | <LOD |
| 166078 | 126.5 | 119.5 | 841.6 | 27.0 | 80.6 | 135.9 | 10.8 | 38.5 | 0.2 | 0.9 | 5.8 | 18.9 | 15.8 | 4.9 | 1.0 | 5.1 | 2.4 | 1.1 | <LOD | 0.1 |
| 158219 | 114.3 | 119.7 | 693.1 | 37.5 | 84.1 | 134.2 | 10.5 | 34.2 | 0.2 | 0.9 | 5.0 | 17.2 | 21.3 | 5.0 | 1.0 | 3.3 | 2.3 | 1.1 | 1.3 | 0.2 |
| 184106 | 122.3 | 130.6 | 1038.8 | 36.9 | 96.3 | 139.9 | 10.8 | 40.5 | 0.2 | 0.8 | 6.6 | 16.3 | 18.9 | 6.9 | 1.1 | 3.3 | 2.5 | 0.5 | 0.9 | 0.2 |
| 167868 | 119.1 | 129.1 | 905.1 | 31.1 | 96.1 | 135.5 | 11.9 | 35.5 | 0.1 | 0.9 | 6.0 | 19.7 | 15.8 | 3.0 | 1.0 | 4.8 | 1.5 | 1.0 | <LOD | 0.2 |
| 178492 | 127.5 | 105.7 | 1283.9 | 33.8 | 91.1 | 134.3 | 10.5 | 35.3 | 0.2 | 9.4 | 4.3 | 15.2 | 13.9 | 4.7 | 0.7 | 3.3 | 2.8 | 1.2 | 0.5 | <LOD |
| 170085 | 112.2 | 108.8 | 877.5 | 35.6 | 76.5 | 129.9 | 9.6 | 38.1 | 0.2 | 0.9 | 6.2 | 16.3 | 12.0 | 4.4 | 1.1 | 4.4 | 1.5 | 1.2 | 1.2 | 0.1 |
| 148423 | 110.3 | 106.7 | 874.2 | 28.1 | 146.5 | 117.5 | 8.4 | 33.0 | 0.1 | 1.1 | 4.2 | 15.8 | 14.0 | 2.8 | 0.9 | 4.1 | 2.6 | 0.4 | <LOD | <LOD |
| 151148 | 124.3 | 109.0 | 1121.5 | 31.0 | 115.3 | 138.3 | 9.8 | 38.0 | 0.2 | 1.3 | 4.8 | 15.3 | 12.7 | 4.6 | 1.6 | 4.4 | 2.3 | 1.1 | 0.5 | 0.2 |
| 151129 | 133.6 | 112.3 | 1299.9 | 33.0 | 89.0 | 127.3 | 8.2 | 35.0 | 0.2 | 1.8 | 4.2 | 13.4 | 17.1 | 3.5 | 0.8 | 2.0 | 1.5 | 1.1 | 0.8 | 0.2 |
| 166354 | 136.2 | 110.3 | 1284.2 | 36.5 | 101.6 | 144.3 | 8.3 | 40.2 | 0.3 | 2.1 | 4.4 | 16.2 | 14.7 | 3.7 | 1.1 | 3.4 | 1.5 | 0.9 | 0.9 | 0.1 |
| 145978 | 126.6 | 86.8 | 959.1 | 27.6 | 110.0 | 124.7 | 8.2 | 29.9 | 0.3 | 2.3 | 3.8 | 12.7 | 10.5 | 1.7 | 0.8 | 4.4 | 1.3 | <LOD | 0.6 | <LOD |
| 154427 | 121.1 | 140.8 | 1223.4 | 26.3 | 118.8 | 117.9 | 8.2 | 25.6 | 0.6 | 2.7 | 2.9 | 12.0 | 9.1 | 2.3 | 1.0 | 1.3 | 1.9 | 0.4 | 0.9 | 0.1 |
| 182057 | 134.5 | 114.8 | 1235.9 | 26.8 | 88.5 | 125.2 | 8.8 | 31.3 | 0.8 | 4.1 | 4.5 | 9.6 | 9.7 | 1.6 | 0.7 | <LOD | 2.0 | <LOD | <LOD | <LOD |

| AT2.1.1track2 | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35734 | 15.9 | 95.1 | <LOD | 15.0 | <LOD | 421.3 | 29.4 | 247.9 | 26.6 | 547.2 | 61.5 | 127.6 | 47.8 | 13.0 | 1.3 | 5.2 | 6.1 | 3.2 | 4.1 | 0.2 |
| 42190 | 17.0 | 110.4 | <LOD | 14.8 | 10.4 | 361.1 | 26.5 | 186.9 | 20.9 | 460.5 | 53.4 | 93.7 | 41.5 | 9.7 | 1.5 | 6.3 | 6.7 | 2.5 | 2.8 | 0.4 |
| 49737 | 25.2 | 142.8 | <LOD | 13.8 | 14.8 | 355.9 | 30.4 | 184.9 | 19.2 | 408.3 | 48.6 | 101.8 | 36.8 | 11.2 | 1.5 | 8.9 | 7.4 | 2.6 | 2.4 | 0.5 |
| 64210 | 32.3 | 143.7 | <LOD | 27.6 | 25.9 | 376.4 | 36.2 | 190.1 | 18.8 | 367.2 | 52.4 | 112.7 | 48.6 | 12.3 | 2.2 | 9.6 | 7.7 | 4.6 | 4.6 | 0.6 |
| 93740 | 37.4 | 154.0 | <LOD | 27.3 | 31.2 | 291.9 | 36.2 | 170.7 | 14.8 | 286.5 | 42.5 | 100.7 | 41.4 | 11.0 | 2.2 | 11.5 | 8.4 | 3.1 | 3.7 | 0.4 |
| 117127 | 52.5 | 492.9 | <LOD | 37.3 | 45.7 | 301.7 | 40.6 | 173.5 | 12.6 | 231.8 | 41.3 | 93.9 | 58.3 | 15.8 | 2.6 | 11.6 | 10.1 | 3.8 | 3.4 | 0.5 |
| 127483 | 51.6 | 198.8 | <LOD | 38.8 | 37.3 | 258.9 | 43.2 | 168.3 | 9.1 | 174.2 | 37.2 | 88.8 | 48.7 | 16.0 | 2.7 | 10.1 | 8.8 | 4.0 | 4.3 | 0.6 |
| 130751 | 52.1 | 226.1 | 34.6 | 35.7 | 55.3 | 245.4 | 39.2 | 151.4 | 6.1 | 116.5 | 33.0 | 80.2 | 54.3 | 12.5 | 2.7 | 9.9 | 8.7 | 5.5 | 3.9 | 0.6 |
| 130313 | 71.0 | 245.5 | <LOD | 37.1 | 61.8 | 216.0 | 39.8 | 144.9 | 4.6 | 87.2 | 32.2 | 85.2 | 60.7 | 15.0 | 2.9 | 11.3 | 8.6 | 4.6 | 3.7 | 0.6 |
| 153487 | 78.1 | 218.1 | 23.1 | 43.7 | 74.7 | 208.0 | 41.7 | 152.1 | 3.3 | 55.0 | 30.2 | 80.9 | 56.3 | 11.7 | 3.2 | 10.7 | 11.2 | 3.8 | 3.8 | 0.4 |
| 165194 | 78.1 | 271.4 | 38.5 | 45.1 | 85.5 | 206.1 | 44.3 | 133.6 | 2.2 | 36.6 | 24.3 | 78.6 | 45.5 | 11.8 | 2.8 | 12.5 | 8.3 | 4.5 | 2.4 | 0.8 |
| 146030 | 79.8 | 248.5 | 52.6 | 49.6 | 53.9 | 198.8 | 38.6 | 118.4 | 1.4 | 21.6 | 23.0 | 71.9 | 56.0 | 12.9 | 2.9 | 12.2 | 10.1 | 4.0 | 4.5 | 0.5 |
| 137472 | 79.0 | 218.2 | 50.3 | 48.9 | 93.9 | 182.7 | 35.5 | 113.9 | 1.2 | 15.6 | 21.8 | 69.0 | 49.5 | 10.8 | 2.5 | 11.1 | 10.8 | 3.9 | 2.8 | 0.5 |
| 145423 | 91.6 | 237.2 | 72.9 | 51.8 | 104.9 | 214.4 | 36.7 | 120.9 | 1.0 | 12.0 | 19.0 | 72.2 | 51.8 | 16.0 | 3.1 | 8.6 | 7.0 | 4.6 | 2.6 | 0.6 |
| 154413 | 92.6 | 213.7 | 102.7 | 38.0 | 75.8 | 174.3 | 40.0 | 98.3 | 0.8 | 9.2 | 21.3 | 54.7 | 49.7 | 12.8 | 2.2 | 12.3 | 7.7 | 4.0 | 3.3 | 0.3 |
| 182825 | 92.5 | 248.2 | 122.0 | 41.0 | 57.8 | 188.1 | 36.4 | 94.0 | 0.9 | 8.8 | 20.9 | 64.2 | 53.6 | 11.2 | 2.6 | 9.4 | 10.6 | 5.3 | 5.5 | 0.4 |
| 166910 | 94.0 | 263.1 | 113.8 | 46.8 | 82.0 | 188.2 | 36.0 | 81.4 | 0.8 | 10.0 | 20.8 | 61.7 | 49.9 | 14.3 | 1.9 | 6.7 | 8.2 | 3.5 | 4.0 | 0.5 |
| 153053 | 80.3 | 220.2 | 148.8 | 46.8 | 75.4 | 164.9 | 33.4 | 82.7 | 0.7 | 6.6 | 18.1 | 61.1 | 45.0 | 10.6 | 2.0 | 8.6 | 8.1 | 3.9 | 4.3 | 0.4 |
| 170106 | 85.4 | 255.2 | 152.3 | 49.6 | 60.8 | 173.2 | 35.5 | 78.3 | 0.6 | 6.7 | 19.6 | 61.7 | 48.0 | 12.3 | 2.2 | 10.3 | 9.0 | 3.2 | 3.9 | 0.5 |
| 154030 | 89.5 | 232.9 | 155.8 | 48.4 | 92.0 | 162.1 | 34.1 | 89.9 | 0.5 | 4.6 | 17.3 | 60.6 | 61.5 | 14.9 | 2.4 | 10.9 | 7.6 | 4.0 | 2.7 | 0.7 |
| 153662 | 84.7 | 284.9 | 67.4 | 54.1 | 47.6 | 159.7 | 38.8 | 81.5 | 0.7 | 4.2 | 18.5 | 63.0 | 63.9 | 16.3 | 2.1 | 11.1 | 6.9 | 3.5 | 3.3 | 0.6 |
| 157824 | 98.3 | 299.3 | 69.3 | 59.0 | 52.7 | 172.0 | 43.0 | 87.1 | 0.4 | 4.2 | 20.7 | 64.2 | 56.8 | 12.8 | 1.9 | 10.1 | 8.2 | 4.2 | 4.0 | 0.5 |
| 154487 | 87.2 | 249.1 | 69.4 | 49.4 | 61.5 | 169.8 | 44.2 | 90.3 | 0.4 | 4.3 | 19.9 | 65.5 | 46.9 | 13.8 | 2.4 | 9.9 | 7.2 | 3.9 | 3.8 | 0.5 |
| 157368 | 90.9 | 246.2 | 46.2 | 41.3 | 40.7 | 145.8 | 46.1 | 92.0 | 0.6 | 4.0 | 22.2 | 67.3 | 63.6 | 13.4 | 2.6 | 11.7 | 9.5 | 4.9 | 4.7 | 0.6 |
| 164542 | 83.8 | 281.3 | 31.7 | 46.9 | 55.1 | 159.7 | 44.2 | 98.3 | 0.6 | 3.6 | 20.1 | 67.0 | 58.3 | 12.1 | 2.5 | 11.8 | 10.2 | 4.0 | 4.0 | 0.5 |
| 174255 | 87.0 | 292.5 | 36.2 | 45.7 | 29.6 | 158.9 | 41.3 | 105.6 | 0.5 | 3.8 | 22.2 | 74.4 | 67.5 | 10.1 | 2.1 | 10.1 | 9.9 | 4.4 | 3.8 | 0.8 |
| 160945 | 82.6 | 319.2 | 31.0 | 45.2 | 57.6 | 173.5 | 46.0 | 95.8 | 0.5 | 3.5 | 23.4 | 70.0 | 60.5 | 14.5 | 1.9 | 12.4 | 11.7 | 4.1 | 4.3 | 0.5 |
| 160417 | 87.7 | 240.0 | 38.6 | 62.5 | 60.4 | 145.5 | 49.5 | 102.0 | 0.5 | 3.8 | 25.1 | 74.7 | 54.5 | 15.4 | 2.6 | 12.1 | 9.3 | 4.0 | 4.5 | 0.5 |
| 154826 | 90.8 | 343.6 | 15.4 | 47.0 | 47.4 | 156.3 | 46.9 | 104.6 | 0.5 | 3.4 | 25.2 | 75.6 | 65.7 | 16.0 | 2.9 | 14.2 | 10.0 | 6.0 | 4.5 | 0.6 |
| 156263 | 83.5 | 288.3 | 25.5 | 54.0 | 62.4 | 155.2 | 46.1 | 110.6 | 0.4 | 3.5 | 20.5 | 68.8 | 65.3 | 16.5 | 2.5 | 12.5 | 9.8 | 3.9 | 5.7 | 0.9 |
| 154933 | 90.0 | 278.1 | 27.5 | 52.6 | 53.6 | 172.7 | 47.0 | 120.6 | 0.3 | 3.2 | 22.0 | 80.0 | 64.3 | 17.3 | 2.6 | 11.6 | 11.0 | 4.8 | 5.3 | 0.6 |
| 170134 | 101.1 | 296.8 | 51.0 | 52.3 | 38.9 | 161.8 | 48.6 | 104.1 | 0.4 | 3.1 | 23.7 | 77.5 | 65.0 | 16.1 | 2.7 | 13.9 | 7.1 | 5.1 | 2.7 | 0.6 |
| 137203 | 74.0 | 242.3 | 22.6 | 48.6 | 43.6 | 149.1 | 40.7 | 91.4 | 0.4 | 2.8 | 21.0 | 71.1 | 46.7 | 12.6 | 2.3 | 8.0 | 7.1 | 4.0 | 3.5 | 0.5 |
| 143936 | 79.6 | 287.8 | 56.3 | 47.1 | 53.1 | 153.2 | 44.5 | 83.8 | 0.4 | 2.7 | 21.5 | 73.8 | 51.1 | 14.2 | 2.7 | 14.0 | 8.1 | 3.8 | 3.1 | 0.7 |
| 171629 | 87.6 | 331.7 | <LOD | 48.9 | 46.2 | 148.6 | 41.4 | 96.1 | 0.4 | 2.5 | 20.8 | 70.3 | 53.5 | 17.3 | 2.1 | 11.8 | 9.1 | 4.1 | 2.8 | 0.5 |
| 142659 | 82.6 | 257.8 | <LOD | 48.8 | 100.7 | 149.8 | 43.0 | 96.2 | 0.5 | 2.9 | 18.0 | 60.2 | 58.0 | 12.6 | 2.4 | 10.3 | 9.7 | 3.3 | 3.7 | 0.6 |
| 171067 | 89.4 | 265.5 | 23.5 | 41.5 | 68.4 | 178.0 | 38.5 | 75.0 | 0.5 | 3.8 | 19.0 | 63.5 | 49.6 | 12.9 | 2.4 | 11.6 | 8.1 | 5.8 | 2.8 | 0.7 |
| 150811 | 77.8 | 269.5 | <LOD | 40.2 | 50.3 | 153.0 | 31.8 | 65.7 | 0.3 | 4.5 | 16.0 | 58.3 | 49.4 | 12.0 | 2.1 | 11.4 | 5.6 | 3.9 | 3.1 | 0.2 |
| 188868 | 88.8 | 272.4 | <LOD | 44.6 | 59.2 | 173.7 | 29.0 | 67.0 | 0.3 | 3.1 | 17.0 | 56.3 | 38.4 | 10.6 | 2.0 | 7.7 | 6.9 | 3.5 | 3.1 | 0.4 |
| 162367 | 71.4 | 196.8 | 22.7 | 46.6 | 65.5 | 149.5 | 30.5 | 53.3 | 0.4 | 2.3 | 15.3 | 44.9 | 34.9 | 10.9 | 1.7 | 8.4 | 5.5 | 2.5 | 1.6 | 0.4 |
| 146034 | 79.8 | 203.5 | 42.4 | 49.2 | 58.9 | 154.8 | 23.7 | 55.4 | 0.3 | 2.3 | 14.7 | 45.4 | 38.3 | 7.7 | 1.7 | 6.1 | 5.4 | 2.6 | 2.3 | 0.2 |
| 146426 | 85.9 | 166.6 | 49.6 | 39.1 | 64.2 | 154.6 | 25.3 | 54.3 | 0.2 | 2.3 | 11.4 | 40.5 | 31.8 | 9.2 | 1.7 | 6.8 | 4.6 | 1.8 | 1.6 | 0.3 |
| 164535 | 95.0 | 130.5 | 77.9 | 40.4 | 99.8 | 172.0 | 26.6 | 47.0 | 0.2 | 1.9 | 14.0 | 40.2 | 29.9 | 8.4 | 2.6 | 6.4 | 6.2 | 1.9 | 2.1 | 0.1 |
| 139328 | 86.9 | 180.9 | 91.7 | 31.5 | 77.9 | 150.4 | 19.9 | 43.5 | 0.2 | 2.1 | 11.3 | 34.2 | 30.9 | 8.3 | 1.4 | 6.5 | 4.6 | 2.7 | 2.2 | 0.2 |
| 162630 | 95.2 | 153.8 | 182.2 | 36.0 | 79.1 | 174.6 | 22.8 | 47.9 | 0.3 | 2.2 | 11.4 | 35.6 | 26.4 | 6.9 | 1.5 | 6.0 | 4.6 | 1.7 | 1.5 | 0.2 |
| 170958 | 97.9 | 156.3 | 126.5 | 40.7 | 59.7 | 158.6 | 20.1 | 41.8 | 0.3 | 1.7 | 11.2 | 29.6 | 28.7 | 7.1 | 1.5 | 4.2 | 3.2 | 1.1 | 2.5 | 0.2 |
| 157689 | 89.3 | 190.4 | 310.7 | 37.7 | 53.7 | 142.8 | 17.5 | 33.1 | 0.2 | 1.6 | 8.2 | 28.7 | 22.8 | 7.1 | 1.9 | 6.2 | 3.7 | 1.9 | 1.7 | 0.2 |
| 160732 | 86.2 | 163.1 | 179.4 | 41.7 | 79.5 | 154.0 | 14.8 | 33.3 | 0.1 | 1.7 | 8.4 | 31.7 | 23.8 | 4.4 | 1.5 | 5.0 | 2.8 | 1.7 | 1.3 | 0.3 |
| 144528 | 101.9 | 125.7 | 359.5 | 35.7 | 93.4 | 161.4 | 14.7 | 30.5 | 0.3 | 1.7 | 7.9 | 24.9 | 18.3 | 7.9 | 1.2 | 3.7 | 2.2 | 1.5 | 1.2 | 0.1 |
| 167593 | 105.5 | 133.0 | 302.8 | 38.4 | 103.7 | 160.8 | 16.4 | 24.8 | 0.1 | 2.0 | 8.8 | 25.3 | 19.8 | 6.0 | 1.0 | 3.3 | 3.1 | 2.0 | 1.1 | 0.1 |
| 163805 | 104.7 | 139.9 | 337.5 | 41.5 | 94.2 | 167.8 | 11.7 | 25.7 | 0.1 | 1.7 | 7.8 | 26.4 | 14.9 | 5.0 | 0.9 | 4.9 | 2.4 | 1.6 | 1.1 | 0.1 |
| 145890 | 100.9 | 108.8 | 363.7 | 31.8 | 48.8 | 153.9 | 12.4 | 23.8 | 0.1 | 1.6 | 6.3 | 22.2 | 17.3 | 5.4 | 0.8 | 3.5 | 2.5 | 0.9 | 0.7 | 0.3 |
| 142747 | 96.3 | 111.5 | 625.3 | 30.2 | 54.0 | 148.2 | 10.1 | 18.6 | 0.1 | 1.5 | 5.6 | 17.7 | 12.4 | 5.0 | 0.7 | 2.4 | 1.9 | 0.9 | 0.4 | 0.2 |
| 156673 | 98.2 | 87.0 | 662.1 | 34.6 | 68.5 | 136.0 | 9.5 | 18.9 | 0.1 | 1.4 | 5.3 | 14.7 | 14.4 | 2.8 | 0.7 | 1.8 | 1.4 | 1.0 | 1.2 | <LOD |
| 146419 | 100.5 | 81.2 | 730.4 | 26.2 | 77.3 | 135.7 | 7.7 | 17.1 | 0.1 | 1.3 | 5.1 | 15.1 | 10.8 | 3.0 | 0.6 | 2.7 | 1.9 | 1.5 | 1.0 | <LOD |
| 187573 | 88.9 | 96.2 | 900.3 | 37.8 | 74.1 | 152.9 | 8.8 | 15.4 | 0.1 | 1.1 | 5.3 | 16.5 | 11.4 | 3.3 | 0.7 | 2.4 | 1.0 | 1.0 | 0.9 | 0.2 |
| 194837 | 88.2 | 94.8 | 1240.6 | 36.9 | 101.1 | 132.4 | 9.0 | 17.0 | <LOD | 1.1 | 4.4 | 12.3 | 9.2 | 2.9 | 0.6 | 1.8 | 1.8 | 0.8 | 0.8 | 0.1 |
| 139630 | 78.8 | 90.4 | 906.1 | 32.2 | 82.0 | 122.1 | 9.3 | 16.7 | 0.1 | 0.9 | 5.1 | 13.2 | 10.3 | 2.3 | 0.5 | 2.1 | 1.7 | 0.6 | <LOD | 0.1 |
| 180177 | 94.8 | 82.8 | 1240.6 | 36.0 | 82.0 | 145.5 | 9.4 | 18.4 | <LOD | 1.4 | 5.9 | 18.1 | 10.8 | 3.6 | 0.9 | 2.5 | 1.4 | 0.8 | 0.6 | <LOD |
| 182396 | 81.9 | 79.6 | 835.5 | 36.7 | 76.1 | 155.2 | 8.8 | 17.5 | 0.2 | 2.7 | 5.3 | 18.8 | 14.3 | 3.5 | 0.8 | 3.5 | 2.3 | 1.4 | <LOD | <LOD |
| 162258 | 78.2 | 94.6 | 778.6 | 32.1 | 149.4 | 160.3 | 10.3 | 22.4 | 0.2 | 4.2 | 7.6 | 21.1 | 20.2 | 3.5 | 0.9 | 4.1 | 2.1 | 0.5 | 0.9 | 0.2 |
| 204698 | 84.8 | 90.4 | 749.8 | 45.4 | 87.5 | 159.7 | 11.7 | 27.0 | 0.2 | 5.4 | 6.8 | 22.4 | 15.2 | 4.4 | 0.8 | 2.2 | 2.8 | 1.4 | 0.5 | <LOD |
| 137924 | 92.6 | 118.3 | 806.6 | 30.8 | 77.9 | 143.9 | 10.6 | 23.5 | 0.4 | 6.9 | 6.7 | 23.9 | 14.2 | 5.8 | 1.3 | 4.1 | 2.2 | 0.9 | 0.5 | 0.1 |
| 182823 | 86.4 | 94.5 | 869.0 | 44.9 | 112.3 | 175.6 | 10.5 | 24.4 | 0.4 | 6.8 | 7.3 | 20.7 | 22.5 | 5.2 | 0.9 | 4.6 | 3.4 | 1.3 | 0.6 | <LOD |
| 186724 | 109.1 | 116.8 | 690.5 | 36.7 | 134.4 | 196.1 | 13.3 | 25.1 | 0.4 | 6.0 | 8.0 | 29.6 | 22.5 | 6.2 | 1.1 | 5.0 | 3.0 | 0.7 | <LOD | 0.5 |
| 127307 | 76.1 | 99.2 | 550.9 | 28.9 | 107.1 | 156.9 | 9.0 | 20.4 | 0.2 | 3.6 | 6.5 | 18.5 | 17.9 | 4.1 | 0.9 | 3.6 | 2.0 | 0.5 | 1.1 | 0.1 |
| 184550 | 88.5 | 120.9 | 586.9 | 33.3 | 104.6 | 156.8 | 10.2 | 20.3 | 0.2 | 3.6 | 8.2 | 19.5 | 20.7 | 4.7 | 1.0 | 3.6 | 2.4 | 0.9 | 0.5 | 0.2 |
| 134018 | 85.8 | 90.4 | 649.1 | 31.0 | 120.3 | 153.7 | 10.3 | 25.6 | 0.1 | 2.9 | 7.0 | 16.7 | 18.4 | 3.3 | 1.1 | 3.2 | 3.4 | 1.8 | 0.5 | <LOD |
| 147604 | 92.7 | 90.4 | 522.7 | 34.6 | 85.0 | 144.7 | 10.7 | 27.7 | 0.2 | 2.8 | 6.5 | 21.5 | 16.3 | 2.7 | 1.2 | 4.8 | 2.0 | 1.0 | 1.1 | 0.1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 149654 | 96.2 | 133.0 | 588.0 | 31.3 | 103.2 | 144.1 | 9.4 | 31.4 | 0.5 | 2.7 | 7.8 | 23.8 | 19.7 | 4.4 | 1.1 | 4.7 | 3.4 | 1.0 | 0.7 | <LOD |
| 170679 | 110.6 | 104.2 | 633.9 | 35.2 | 86.5 | 151.1 | 13.2 | 37.9 | 0.3 | 10.2 | 7.4 | 22.9 | 20.4 | 4.2 | 1.1 | 4.4 | 3.7 | 1.5 | 1.3 | 0.2 |
| 158964 | 114.7 | 114.9 | 581.4 | 28.5 | 97.9 | 144.7 | 10.7 | 30.9 | 0.3 | 2.2 | 6.5 | 19.8 | 21.7 | 3.0 | 1.0 | 3.9 | 2.2 | 0.5 | <LOD | 0.2 |
| 134755 | 107.8 | 117.0 | 543.2 | 26.7 | 92.5 | 152.3 | 11.3 | 26.6 | 0.2 | 1.8 | 7.3 | 15.8 | 12.3 | 3.8 | 0.4 | 2.5 | 2.8 | 0.6 | <LOD | <LOD |
| 123933 | 100.2 | 122.0 | 423.9 | 30.1 | 90.1 | 144.7 | 14.0 | 31.1 | 0.2 | 2.2 | 6.7 | 14.4 | 11.5 | 3.8 | 0.9 | 2.2 | 1.3 | 1.0 | <LOD | <LOD |
| 142916 | 102.5 | 116.8 | 635.0 | 33.4 | | 141.1 | 12.5 | 23.3 | <LOD | 2.4 | 5.7 | 15.4 | 10.3 | 6.7 | 0.9 | <LOD | 3.7 | <LOD | <LOD | <LOD |
| AT2.1.2track1 | | | | | | | | | | | | | | | | | | | | |
| 69042 | 32.2 | 168.8 | <LOD | 25.5 | 15.8 | 320.2 | 37.5 | 182.6 | 15.0 | 336.4 | 58.2 | 120.8 | 57.6 | 14.2 | 1.9 | 10.0 | 11.6 | 3.9 | 5.1 | 0.5 |
| 77187 | 34.9 | 187.8 | <LOD | 27.2 | 24.7 | 280.7 | 42.3 | 143.0 | 11.8 | 249.0 | 45.0 | 97.1 | 56.3 | 16.2 | 2.0 | 9.8 | 11.9 | 4.3 | 4.4 | 0.8 |
| 107655 | 49.0 | 259.5 | <LOD | 37.3 | 28.9 | 233.6 | 48.3 | 131.7 | 8.8 | 159.5 | 39.1 | 98.2 | 46.8 | 13.9 | 2.1 | 12.2 | 9.4 | 5.6 | 5.1 | 0.7 |
| 126564 | 51.4 | 263.7 | 16.9 | 36.9 | 28.9 | 188.9 | 55.2 | 132.4 | 5.6 | 91.2 | 34.5 | 88.0 | 52.7 | 17.4 | 1.9 | 13.5 | 9.3 | 4.5 | 5.8 | 0.6 |
| 138397 | 58.9 | 259.6 | 22.7 | 46.9 | 39.5 | 165.6 | 56.3 | 117.3 | 3.8 | 56.7 | 29.5 | 85.3 | 57.7 | 15.4 | 1.9 | 13.9 | 10.1 | 6.7 | 4.9 | 0.7 |
| 142836 | 71.6 | 356.4 | 18.1 | 51.8 | 53.0 | 161.7 | 48.4 | 120.8 | 2.4 | 33.6 | 28.2 | 85.6 | 59.4 | 16.3 | 2.5 | 14.8 | 12.4 | 5.4 | 5.0 | 0.6 |
| 144326 | 66.4 | 278.8 | <LOD | 52.1 | 29.1 | 138.5 | 50.3 | 113.0 | 1.5 | 21.2 | 25.2 | 77.8 | 59.8 | 14.5 | 2.9 | 13.4 | 9.3 | 4.6 | 5.7 | 0.8 |
| 139475 | 67.6 | 301.0 | 41.4 | 45.4 | 42.9 | 150.6 | 48.0 | 111.7 | 1.0 | 14.2 | 25.1 | 75.5 | 59.0 | 13.5 | 2.8 | 12.1 | 8.4 | 4.6 | 4.5 | 0.5 |
| 148579 | 73.1 | 297.4 | 51.8 | 42.9 | 49.1 | 141.7 | 45.5 | 100.1 | 0.9 | 11.1 | 24.5 | 79.0 | 59.3 | 12.8 | 2.0 | 12.6 | 8.7 | 4.6 | 5.4 | 0.6 |
| 150982 | 94.2 | 262.0 | 24.6 | 49.3 | 47.8 | 152.2 | 40.7 | 112.3 | 0.9 | 8.7 | 22.8 | 77.0 | 49.9 | 10.7 | 1.7 | 10.8 | 8.6 | 4.4 | 3.2 | 0.7 |
| 156226 | 81.2 | 290.1 | 42.4 | 41.9 | 61.1 | 143.3 | 46.0 | 91.5 | 0.7 | 7.3 | 21.7 | 71.4 | 50.4 | 12.8 | 2.3 | 11.9 | 6.9 | 4.5 | 3.5 | 0.5 |
| 156463 | 80.3 | 270.8 | 28.0 | 43.9 | 34.6 | 144.5 | 40.7 | 98.9 | 0.6 | 5.6 | 21.6 | 68.2 | 49.8 | 11.3 | 2.3 | 10.0 | 9.1 | 4.1 | 3.2 | 0.6 |
| 146128 | 76.9 | 239.6 | 36.4 | 51.4 | 50.6 | 132.1 | 40.7 | 89.6 | 0.4 | 4.4 | 21.3 | 70.2 | 48.3 | 11.7 | 1.7 | 9.6 | 12.3 | 5.1 | 3.3 | 0.6 |
| 145199 | 91.1 | 312.9 | 41.9 | 59.6 | 64.3 | 157.0 | 42.4 | 94.9 | 0.5 | 8.0 | 19.9 | 75.8 | 54.0 | 15.3 | 3.5 | 9.2 | 7.6 | 5.8 | 4.7 | 0.5 |
| 145104 | 83.5 | 246.0 | 37.7 | 36.3 | 43.8 | 142.5 | 41.5 | 89.3 | 0.3 | 3.6 | 22.0 | 63.9 | 45.5 | 11.7 | 2.2 | 16.2 | 8.8 | 4.6 | 3.8 | 0.6 |
| 155775 | 78.7 | 282.8 | 36.5 | 38.8 | 42.4 | 142.0 | 39.3 | 79.9 | 0.4 | 3.5 | 19.4 | 68.5 | 51.4 | 13.0 | 2.5 | 9.6 | 8.8 | 6.0 | 3.8 | 0.3 |
| 153149 | 83.0 | 336.2 | 55.2 | 51.4 | 58.4 | 145.4 | 46.3 | 80.3 | 0.4 | 3.3 | 21.6 | 67.1 | 46.2 | 15.3 | 2.0 | 10.6 | 7.9 | 3.9 | 3.5 | 0.7 |
| 159671 | 85.2 | 286.4 | 52.3 | 49.5 | 68.9 | 138.7 | 37.4 | 89.0 | 0.4 | 2.9 | 18.5 | 66.1 | 54.3 | 10.7 | 2.2 | 11.4 | 8.3 | 3.4 | 5.2 | 0.5 |
| 164369 | 87.5 | 291.5 | 95.0 | 48.4 | 55.5 | 140.2 | 37.9 | 80.6 | 0.5 | 2.6 | 18.4 | 63.1 | 55.5 | 11.5 | 1.9 | 10.3 | 7.7 | 3.6 | 3.1 | 0.6 |
| 151677 | 89.0 | 266.9 | 96.1 | 42.3 | 74.1 | 156.5 | 34.6 | 77.9 | 0.3 | 11.4 | 17.2 | 55.8 | 52.7 | 11.6 | 2.5 | 10.9 | 6.7 | 3.0 | 2.4 | 0.4 |
| 149287 | 83.7 | 264.1 | 79.0 | 46.3 | 51.9 | 138.5 | 32.9 | 72.1 | 0.4 | 2.5 | 14.2 | 52.7 | 53.4 | 11.6 | 2.2 | 8.3 | 7.5 | 3.0 | 2.2 | 0.4 |
| 166305 | 95.3 | 234.6 | 112.0 | 48.1 | 64.4 | 162.4 | 34.5 | 69.9 | 0.3 | 2.3 | 17.2 | 51.8 | 41.3 | 10.5 | 1.8 | 8.3 | 6.0 | 3.7 | 2.5 | 0.4 |
| 173763 | 92.2 | 233.2 | 220.0 | 49.0 | 64.1 | 176.4 | 30.1 | 64.5 | 0.3 | 2.5 | 14.0 | 43.6 | 34.3 | 11.1 | 2.0 | 8.5 | 6.8 | 3.1 | 3.2 | 0.4 |
| 172068 | 93.4 | 207.9 | 147.9 | 36.2 | 61.0 | 163.5 | 31.5 | 71.0 | 0.3 | 2.0 | 15.5 | 50.2 | 42.6 | 8.2 | 1.5 | 7.2 | 7.1 | 2.7 | 2.3 | 0.3 |
| 173947 | 90.0 | 216.2 | 169.9 | 40.2 | 66.9 | 173.4 | 23.6 | 63.9 | 0.3 | 2.0 | 10.7 | 39.4 | 26.3 | 6.9 | 1.2 | 5.4 | 5.5 | 3.1 | 2.4 | 0.3 |
| 159531 | 90.4 | 153.2 | 212.8 | 35.7 | 41.8 | 163.5 | 19.5 | 55.4 | 0.3 | 2.2 | 11.3 | 34.2 | 27.5 | 6.2 | 1.3 | 5.3 | 5.4 | 2.0 | 2.1 | 0.4 |
| 171984 | 84.9 | 162.1 | 206.4 | 39.5 | 87.7 | 172.3 | 20.9 | 47.4 | 0.2 | 1.8 | 9.8 | 31.4 | 20.3 | 5.8 | 1.3 | 4.5 | 3.6 | 1.2 | 1.1 | 0.1 |
| 186747 | 95.1 | 134.9 | 369.7 | 44.3 | 68.4 | 161.6 | 18.6 | 45.7 | 0.3 | 2.0 | 9.3 | 28.5 | 24.3 | 4.7 | 1.6 | 5.0 | 2.8 | 1.2 | 1.7 | 0.3 |
| 173510 | 117.8 | 166.4 | 304.9 | 37.2 | 77.6 | 171.4 | 17.3 | 46.6 | 0.3 | 2.7 | 9.7 | 28.1 | 22.3 | 6.3 | 1.2 | 4.9 | 4.3 | 1.9 | 0.9 | 0.2 |
| 156924 | 103.7 | 127.9 | 352.8 | 58.1 | 93.1 | 154.7 | 14.2 | 44.6 | 0.2 | 2.7 | 7.7 | 26.8 | 23.4 | 6.3 | 0.9 | 4.3 | 2.5 | 1.3 | 1.6 | 0.2 |
| 147639 | 112.4 | 119.7 | 605.8 | 36.9 | 69.2 | 170.0 | 12.9 | 51.5 | 0.2 | 2.4 | 6.7 | 24.8 | 19.5 | 7.2 | 0.9 | 5.4 | 4.2 | 1.1 | 0.6 | 0.3 |
| 183014 | 140.7 | 129.3 | 1417.4 | 39.2 | 63.7 | 167.4 | 14.6 | 46.7 | 0.4 | 2.6 | 8.2 | 23.9 | 19.9 | 4.1 | 0.9 | 5.1 | 3.1 | 0.9 | 1.1 | 0.2 |
| 174819 | 116.0 | 111.4 | 816.4 | 42.9 | 76.0 | 156.7 | 13.9 | 35.5 | 0.3 | 2.2 | 7.2 | 24.2 | 15.9 | 4.5 | 1.4 | 2.8 | 3.2 | 1.1 | 1.7 | 0.1 |
| 171599 | 117.8 | 129.3 | 1555.2 | 39.9 | 85.5 | 159.4 | 15.7 | 44.9 | 0.2 | 1.9 | 7.5 | 25.3 | 16.6 | 5.1 | 1.3 | 4.5 | 3.8 | 1.8 | 0.8 | 0.1 |
| 176247 | 129.8 | 137.9 | 871.6 | 34.5 | 100.7 | 154.3 | 13.5 | 45.1 | 0.3 | 2.0 | 8.0 | 22.5 | 17.2 | 6.6 | 0.9 | 5.2 | 3.0 | 0.9 | 1.5 | 0.2 |
| 133133 | 125.7 | 127.9 | 1260.8 | 31.7 | 136.9 | 150.3 | 12.5 | 48.6 | 0.2 | 2.2 | 6.6 | 21.1 | 19.5 | 3.9 | 1.3 | 4.6 | 2.9 | 1.8 | 0.7 | 0.1 |
| 152980 | 120.7 | 120.7 | 738.1 | 32.6 | 85.2 | 154.0 | 10.8 | 41.6 | 0.3 | 2.0 | 7.4 | 24.9 | 17.7 | 4.4 | 1.3 | 3.3 | 2.8 | 1.6 | 0.9 | 0.1 |
| 187666 | 123.9 | 125.7 | 1797.2 | 37.3 | 95.0 | 163.9 | 11.1 | 41.8 | 0.2 | 1.8 | 7.4 | 24.5 | 25.2 | 4.7 | 1.4 | 3.9 | 1.9 | 1.6 | 1.2 | 0.1 |
| 169653 | 129.7 | 113.3 | 926.8 | 32.4 | 85.3 | 155.9 | 11.6 | 36.8 | 0.2 | 2.0 | 8.8 | 26.5 | 16.2 | 5.0 | 0.8 | 4.8 | 4.9 | 1.6 | 0.6 | 0.1 |
| 173670 | 122.0 | 117.9 | 778.2 | 37.2 | 132.3 | 157.3 | 12.8 | 37.0 | 0.2 | 1.7 | 8.0 | 22.0 | 19.9 | 5.0 | 1.2 | 2.8 | 2.7 | 1.5 | 1.1 | <LOD |
| 150268 | 113.9 | 113.9 | 759.4 | 32.6 | 70.8 | 148.8 | 11.1 | 34.8 | 0.2 | 1.9 | 7.8 | 21.9 | 18.8 | 5.1 | 1.0 | 4.0 | 3.1 | 0.6 | 0.8 | 0.1 |
| 164887 | 113.7 | 102.0 | 1116.4 | 33.1 | 82.7 | 140.9 | 12.4 | 36.3 | 0.3 | 1.5 | 6.6 | 23.2 | 21.7 | 4.1 | 1.1 | 4.1 | 3.0 | 1.2 | 1.2 | 0.1 |
| 186989 | 122.5 | 76.6 | 973.6 | 32.1 | 91.9 | 161.7 | 11.7 | 32.6 | 0.2 | 2.2 | 8.2 | 23.4 | 20.8 | 3.8 | 0.9 | 5.9 | 2.3 | 1.8 | 1.1 | 0.1 |
| 154561 | 110.7 | 118.5 | 958.0 | 28.8 | 91.8 | 155.4 | 11.2 | 30.7 | 0.2 | 1.9 | 7.0 | 20.1 | 17.9 | 4.1 | 0.8 | 4.2 | 3.3 | 0.8 | 0.9 | 0.2 |
| 147869 | 112.3 | 87.9 | 1533.0 | 28.7 | 115.0 | 156.8 | 9.4 | 30.8 | 0.2 | 1.4 | 5.9 | 16.7 | 18.1 | 4.1 | 0.8 | 3.5 | 1.6 | 1.2 | 1.0 | <LOD |
| 179882 | 132.6 | 112.1 | 1411.8 | 33.9 | 115.2 | 161.4 | 12.4 | 34.6 | 0.3 | 1.9 | 7.8 | 21.8 | 17.9 | 6.7 | 1.2 | 3.4 | 2.9 | 0.9 | 1.2 | 0.1 |
| 154584 | 115.3 | 129.0 | 2958.2 | 33.6 | 77.3 | 150.7 | 11.8 | 31.5 | 0.2 | 1.3 | 6.8 | 20.4 | 17.8 | 5.4 | 0.8 | 4.8 | 2.8 | 0.7 | <LOD | 0.2 |
| 154672 | 120.3 | 108.9 | 1421.1 | 37.3 | 89.5 | 146.3 | 10.5 | 31.4 | 0.1 | 1.4 | 7.2 | 22.9 | 16.6 | 5.4 | 0.8 | 4.5 | 1.5 | 1.5 | 0.5 | <LOD |
| 156404 | 118.3 | 99.3 | 2116.3 | 38.5 | 99.5 | 152.3 | 10.9 | 32.3 | 0.1 | 1.3 | 7.1 | 20.4 | 16.4 | 4.5 | 1.1 | 3.4 | 1.9 | 1.0 | 0.9 | <LOD |
| 152058 | 132.4 | 107.7 | 1734.1 | 35.4 | 136.9 | 145.0 | 9.3 | 32.7 | 0.1 | 2.0 | 6.8 | 20.3 | 21.0 | 4.7 | 0.9 | 2.8 | 2.5 | 0.7 | 0.5 | 0.2 |
| 180834 | 132.6 | 116.0 | 1243.8 | 33.3 | 125.8 | 150.8 | 11.5 | 32.7 | 0.2 | 1.8 | 6.3 | 19.0 | 16.3 | 4.2 | 1.1 | 3.4 | 1.9 | 1.6 | 1.1 | 0.1 |
| 166506 | 147.2 | 110.8 | 1253.7 | 31.7 | 81.8 | 165.8 | 10.4 | 32.8 | 0.2 | 1.8 | 6.6 | 19.5 | 15.1 | 5.1 | 1.1 | 3.8 | 2.5 | 1.2 | 0.8 | 0.2 |
| 179050 | 126.8 | 115.7 | 1775.3 | 32.5 | 99.0 | 164.3 | 10.7 | 28.3 | 0.1 | 1.7 | 5.6 | 19.7 | 16.6 | 5.5 | 0.8 | 3.9 | 2.1 | 1.0 | 0.5 | <LOD |
| 165872 | 138.9 | 102.1 | 1460.8 | 32.5 | 80.9 | 158.4 | 11.6 | 30.1 | 0.1 | 1.7 | 4.8 | 15.5 | 16.3 | 4.2 | 1.1 | 3.5 | 3.1 | 0.8 | 0.5 | <LOD |
| 147326 | 115.4 | 88.1 | 1514.9 | 25.9 | 96.4 | 142.7 | 7.9 | 26.2 | 0.1 | 1.7 | 5.5 | 15.6 | 14.5 | 4.7 | 1.1 | 3.3 | 2.1 | 0.7 | 1.5 | <LOD |
| 163928 | 112.4 | 96.6 | 1361.7 | 35.8 | 92.6 | 143.2 | 8.3 | 25.9 | 0.1 | 1.5 | 5.6 | 16.1 | 17.4 | 4.6 | 1.0 | 6.5 | 2.0 | 0.8 | 0.6 | <LOD |
| 199194 | 117.9 | 99.7 | 1740.1 | 35.5 | 141.0 | 155.8 | 8.1 | 26.4 | 0.1 | 1.5 | 5.7 | 17.7 | 15.4 | 4.2 | 0.9 | 3.4 | 2.8 | 0.9 | 1.1 | <LOD |
| 175368 | 114.8 | 110.7 | 1530.7 | 33.1 | 101.0 | 146.9 | 10.7 | 28.0 | 0.1 | 1.4 | 5.6 | 17.8 | 13.6 | 3.4 | 1.2 | 3.0 | 2.7 | 1.2 | <LOD | 0.2 |
| 165776 | 122.6 | 90.8 | 1842.5 | 34.4 | 98.7 | 144.2 | 10.0 | 29.2 | 0.2 | 1.5 | 5.0 | 16.1 | 14.6 | 4.5 | 0.8 | 3.2 | 0.9 | 1.1 | 0.5 | 0.1 |
| 156926 | 117.5 | 87.2 | 1402.8 | 39.4 | 95.0 | 149.5 | 8.4 | 28.6 | 0.1 | 1.4 | 5.1 | 17.5 | 13.6 | 5.4 | 1.1 | 4.4 | 1.7 | 0.5 | 0.6 | <LOD |
| 162132 | 121.8 | 89.7 | 1355.9 | 26.2 | 145.6 | 133.8 | 9.0 | 27.3 | 0.2 | 1.3 | 6.1 | 16.6 | 20.6 | 5.1 | 0.7 | 2.5 | 1.3 | 0.4 | 0.6 | 0.1 |
| 171798 | 123.6 | 94.9 | 1817.7 | 32.9 | 106.1 | 159.4 | 10.1 | 36.2 | 0.3 | 1.5 | 5.8 | 17.4 | 20.8 | 3.0 | 1.2 | 2.6 | 1.5 | 1.2 | 0.7 | 0.2 |
| 156445 | 126.5 | 119.3 | 1834.1 | 28.1 | 86.9 | 140.5 | 8.9 | 32.0 | 0.2 | 1.0 | 5.8 | 18.5 | 16.6 | 5.0 | 0.8 | 4.3 | 1.3 | 0.8 | 1.0 | 0.1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 181305 | 140.6 | 103.2 | 1779.7 | 33.8 | 99.1 | 158.8 | 10.1 | 37.5 | 0.2 | 1.3 | 7.0 | 19.0 | 19.7 | 5.1 | 1.2 | 3.3 | 3.4 | 0.6 | 0.9 | <LOD |
| 158609 | 144.2 | 90.4 | 1394.0 | 32.3 | 94.0 | 151.7 | 8.8 | 32.4 | 0.2 | 1.5 | 6.0 | 21.2 | 19.7 | 4.8 | 1.1 | 4.4 | 3.1 | 0.8 | 1.5 | 0.1 |
| 164171 | 130.0 | 133.9 | 1897.4 | 26.2 | 127.2 | 149.4 | 10.0 | 31.1 | 0.3 | 1.6 | 6.6 | 20.1 | 17.7 | 5.0 | 1.4 | 4.9 | 2.9 | 1.1 | 1.3 | <LOD |
| 167570 | 131.6 | 114.1 | 1786.9 | 33.4 | 84.0 | 151.5 | 10.8 | 41.5 | 0.3 | 1.5 | 7.6 | 22.1 | 17.6 | 3.6 | 1.7 | 5.1 | 1.8 | 0.7 | 1.4 | <LOD |
| 170226 | 140.8 | 109.9 | 2102.8 | 33.0 | 93.1 | 142.8 | 9.9 | 39.8 | 0.5 | 1.3 | 8.1 | 18.8 | 16.1 | 3.6 | 0.9 | 2.9 | 2.1 | 1.0 | 0.7 | <LOD |
| 160245 | 136.4 | 124.9 | 1797.8 | 31.1 | 91.7 | 163.3 | 12.4 | 40.8 | 0.3 | 1.6 | 7.6 | 21.2 | 20.2 | 5.0 | 0.8 | 4.7 | 2.0 | 1.3 | 0.7 | 0.1 |
| 157728 | 130.1 | 125.2 | 2321.1 | 37.0 | 109.1 | 149.2 | 10.8 | 46.5 | 0.4 | 1.1 | 6.7 | 24.8 | 18.1 | 6.3 | 1.0 | 4.3 | 2.7 | 1.2 | 0.8 | 0.2 |
| 168580 | 143.5 | 121.3 | 2674.3 | 33.4 | 79.2 | 154.1 | 12.0 | 49.8 | 0.4 | 1.5 | 6.8 | 21.9 | 16.4 | 5.8 | 1.0 | 4.4 | 2.7 | 1.0 | 1.1 | <LOD |
| 166729 | 147.6 | 120.8 | 2046.3 | 35.6 | 71.9 | 147.0 | 10.6 | 43.4 | 0.5 | 1.4 | 7.1 | 25.2 | 23.8 | 4.1 | 1.1 | 4.6 | 2.0 | 1.1 | 1.0 | 0.2 |
| 134301 | 133.5 | 133.4 | 2244.6 | 33.4 | 99.5 | 151.7 | 12.1 | 42.7 | 0.4 | 2.2 | 8.0 | 21.9 | 15.4 | 4.0 | 1.1 | 5.5 | 2.6 | 1.6 | 1.2 | 0.2 |
| 146143 | 162.7 | 134.3 | 1743.7 | 24.6 | 94.1 | 163.8 | 11.6 | 39.4 | 0.4 | 1.6 | 8.1 | 24.9 | 21.4 | 7.8 | 1.1 | 4.4 | 3.2 | 1.6 | 1.0 | 0.2 |
| 154433 | 142.9 | 129.9 | 2500.0 | 27.1 | 122.6 | 165.9 | 13.8 | 47.7 | 0.6 | 1.7 | 8.0 | 23.4 | 22.0 | 6.2 | 1.4 | 4.1 | 2.8 | 1.5 | 1.9 | 0.2 |
| 164561 | 123.7 | 113.4 | 1656.9 | 37.5 | 98.0 | 157.3 | 13.4 | 55.7 | 0.5 | 1.8 | 8.9 | 24.6 | 24.9 | 5.0 | 1.4 | 2.5 | 2.8 | 1.6 | 0.7 | 0.2 |
| 175394 | 134.1 | 135.9 | 3334.7 | 44.0 | 65.4 | 169.9 | 12.2 | 53.5 | 0.5 | 1.9 | 8.7 | 23.4 | 20.3 | 6.3 | 1.5 | 4.1 | 3.0 | 1.8 | 0.9 | 0.2 |
| 168181 | 141.5 | 130.8 | 2500.2 | 34.8 | 82.6 | 155.0 | 13.5 | 43.5 | 0.4 | 1.8 | 8.7 | 25.2 | 24.0 | 5.3 | 1.4 | 4.9 | 3.8 | 1.2 | 1.0 | 0.2 |
| 160148 | 139.4 | 139.7 | 2047.9 | 31.8 | 84.9 | 153.7 | 14.6 | 52.0 | 0.6 | 2.0 | 8.3 | 25.5 | 24.5 | 4.4 | 1.0 | 3.9 | 2.5 | 1.8 | 0.5 | 0.2 |
| 153721 | 158.6 | 152.0 | 2015.0 | 41.6 | 74.5 | 157.1 | 15.2 | 55.6 | 0.4 | 1.7 | 10.0 | 32.5 | 26.4 | 5.4 | 1.4 | 3.8 | 2.4 | 1.9 | 0.8 | 0.2 |
| 177526 | 129.1 | 158.3 | 1132.7 | 38.6 | 84.1 | 152.9 | 13.6 | 54.4 | 0.6 | 1.9 | 8.1 | 28.6 | 24.4 | 6.8 | 1.7 | 6.4 | 3.9 | 1.1 | 1.2 | 0.3 |
| 175682 | 138.9 | 192.2 | 1801.6 | 39.7 | 79.3 | 167.7 | 19.6 | 54.3 | 0.4 | 2.3 | 11.8 | 35.5 | 32.6 | 7.6 | 2.1 | 6.7 | 5.1 | 1.8 | 1.4 | 0.2 |
| 177842 | 126.8 | 181.2 | 1147.7 | 44.3 | 48.0 | 168.7 | 20.4 | 56.2 | 0.5 | 2.4 | 11.4 | 42.5 | 27.9 | 6.9 | 1.9 | 7.1 | 5.5 | 2.5 | 1.5 | 0.2 |
| 150370 | 111.5 | 182.4 | 1038.9 | 36.5 | 56.7 | 160.6 | 19.9 | 51.8 | 0.4 | 1.8 | 14.3 | 41.3 | 35.1 | 10.0 | 1.6 | 8.0 | 4.6 | 2.6 | 3.0 | 0.5 |
| 143617 | 100.7 | 184.9 | 1200.4 | 31.7 | 45.7 | 151.1 | 24.2 | 72.6 | 0.3 | 3.3 | 15.2 | 45.9 | 36.6 | 8.1 | 1.8 | 8.6 | 6.0 | 2.1 | 1.1 | 0.2 |
| 145146 | 99.2 | 232.5 | 1468.7 | 47.7 | 64.5 | 158.2 | 26.3 | 61.9 | 0.4 | 4.7 | 15.4 | 46.9 | 35.3 | 8.4 | 2.0 | 8.0 | 5.1 | 3.0 | 2.3 | 0.4 |
| 178498 | 107.3 | 237.0 | 753.3 | 45.4 | 76.5 | 182.1 | 35.5 | 69.8 | 0.5 | 7.2 | 23.2 | 60.5 | 42.4 | 12.3 | 1.9 | 11.1 | 9.0 | 3.9 | 3.1 | 0.5 |
| 181618 | 93.1 | 249.2 | 814.3 | 47.3 | 56.8 | 181.1 | 34.1 | 75.2 | 0.6 | 9.2 | 26.2 | 65.0 | 58.0 | 10.9 | 1.7 | 8.4 | 8.4 | 3.8 | 2.4 | 0.6 |
| 145390 | 94.7 | 245.1 | 854.0 | 49.3 | 44.5 | 158.4 | 34.2 | 74.2 | 0.4 | 10.7 | 24.8 | 58.2 | 41.2 | 9.9 | 2.3 | 9.3 | 7.0 | 2.7 | 4.5 | 0.5 |
| 158506 | 103.9 | 278.7 | 335.9 | 53.3 | 70.5 | 171.2 | 36.4 | 73.5 | 0.5 | 11.6 | 25.2 | 65.2 | 57.9 | 10.6 | 2.5 | 9.2 | 8.1 | 3.9 | 2.2 | 0.7 |
| 142065 | 81.6 | 224.6 | 374.7 | 44.1 | 49.8 | 158.2 | 35.2 | 74.2 | 0.5 | 12.6 | 24.8 | 78.0 | 55.0 | 11.9 | 2.4 | 8.4 | 7.3 | 3.5 | 4.7 | 0.5 |
| 145830 | 89.4 | 262.8 | 423.9 | 46.7 | 41.5 | 177.6 | 39.8 | 77.1 | 0.4 | 13.4 | 28.4 | 81.6 | 39.5 | 12.1 | 2.1 | 10.5 | 6.9 | 4.2 | 4.2 | 0.4 |
| 169052 | 79.5 | 244.3 | 415.3 | 48.3 | 52.2 | 162.5 | 37.8 | 72.7 | 0.6 | 12.7 | 28.9 | 77.1 | 62.3 | 15.8 | 1.7 | 11.2 | 8.1 | 3.7 | 3.0 | 0.5 |
| 160812 | 92.9 | 259.0 | 316.6 | 43.0 | 47.6 | 173.3 | 39.8 | 87.0 | 0.5 | 11.5 | 25.5 | 71.9 | 57.6 | 13.9 | 2.0 | 12.0 | 8.4 | 3.2 | 3.7 | 0.7 |
| 141904 | 77.9 | 246.6 | 620.1 | 43.0 | 51.9 | 171.5 | 40.0 | 85.2 | 0.4 | 10.7 | 27.8 | 74.7 | 57.4 | 11.4 | 1.8 | 10.6 | 10.3 | 2.8 | 4.0 | 0.6 |
| 186039 | 83.3 | 273.6 | 322.4 | 48.5 | 52.4 | 175.6 | 44.2 | 88.3 | 0.6 | 13.6 | 31.0 | 75.2 | 56.0 | 15.0 | 2.3 | 10.8 | 9.7 | 4.7 | 2.8 | 0.8 |
| 156728 | 78.5 | 303.3 | 272.7 | 42.7 | 73.2 | 157.1 | 39.5 | 76.9 | 0.4 | 10.9 | 30.4 | 77.3 | 47.0 | 12.5 | 1.6 | 12.2 | 9.8 | 3.8 | 4.4 | 0.7 |
| 172746 | 82.6 | 302.3 | 246.8 | 45.9 | 57.3 | 157.9 | 40.1 | 73.6 | 0.4 | 9.2 | 26.4 | 69.9 | 45.1 | 12.7 | 2.6 | 9.2 | 7.0 | 4.0 | 3.9 | 0.6 |
| 157396 | 91.6 | 222.4 | 288.2 | 49.2 | 36.6 | 156.3 | 36.5 | 90.2 | 0.4 | 9.4 | 24.5 | 70.8 | 57.0 | 16.9 | 2.6 | 9.7 | 9.1 | 4.5 | 3.9 | 0.4 |
| 145230 | 78.2 | 289.4 | 375.5 | 41.1 | 45.9 | 159.9 | 38.1 | 78.1 | 0.6 | 9.0 | 23.6 | 70.0 | 56.8 | 12.3 | 2.3 | 11.0 | 9.6 | 4.0 | 3.5 | 0.5 |
| 175603 | 87.1 | 265.6 | 401.6 | 61.8 | 74.8 | 171.1 | 43.8 | 77.9 | 0.6 | 9.4 | 28.9 | 71.3 | 64.5 | 13.6 | 2.1 | 10.1 | 8.9 | 4.8 | 4.5 | 0.6 |
| 171126 | 79.7 | 333.3 | 208.0 | 55.7 | 40.5 | 176.9 | 48.0 | 92.5 | 0.5 | 8.2 | 26.2 | 73.9 | 52.7 | 16.5 | 3.2 | 13.1 | 7.5 | 4.3 | 5.5 | 0.3 |
| 158371 | 93.3 | 244.3 | 182.8 | 47.9 | 58.1 | 184.3 | 40.2 | 82.3 | 0.4 | 8.7 | 28.2 | 77.9 | 61.2 | 18.3 | 2.1 | 10.8 | 10.3 | 3.7 | 3.3 | 0.6 |
| 167369 | 80.1 | 295.7 | 234.6 | 54.2 | 56.4 | 166.8 | 38.2 | 85.9 | 0.5 | 8.5 | 23.5 | 78.0 | 51.7 | 12.8 | 2.0 | 12.0 | 9.4 | 3.6 | 4.2 | 0.2 |
| 147551 | 87.4 | 247.1 | 309.1 | 51.6 | 57.1 | 185.2 | 40.6 | 78.6 | 0.6 | 12.2 | 29.5 | 85.5 | 50.8 | 12.6 | 2.3 | 10.2 | 8.3 | 6.3 | 4.6 | 0.4 |
| 155691 | 81.4 | 269.6 | 323.4 | 50.2 | 37.2 | 176.9 | 41.0 | 83.0 | 0.4 | 16.0 | 32.2 | 74.2 | 52.2 | 13.8 | 2.4 | 11.5 | 9.8 | 3.4 | 3.4 | 0.5 |
| 134012 | 84.7 | 231.9 | 329.6 | 47.0 | 38.3 | 174.4 | 41.5 | 78.7 | 0.6 | 18.2 | 29.9 | 71.0 | 56.1 | 12.5 | 2.5 | 12.2 | 8.9 | 4.9 | 4.0 | 0.5 |
| 157007 | 87.0 | 284.1 | 369.3 | 51.8 | 35.6 | 182.5 | 46.2 | 91.1 | 0.7 | 20.6 | 31.6 | 77.0 | 57.1 | 10.3 | 3.0 | 11.8 | 9.0 | 4.4 | 3.1 | 0.5 |
| 171478 | 86.2 | 305.1 | 511.0 | 54.6 | 40.2 | 193.6 | 41.2 | 90.4 | 0.6 | 24.4 | 40.4 | 88.6 | 61.8 | 15.5 | 2.3 | 11.6 | 10.1 | 6.0 | 4.3 | 0.4 |
| 144316 | 84.9 | 274.9 | 238.3 | 50.6 | 51.3 | 167.3 | 42.3 | 88.7 | 0.9 | 22.3 | 32.9 | 76.3 | 55.1 | 12.2 | 1.9 | 8.5 | 8.6 | 3.3 | 4.8 | 0.5 |
| 153577 | 81.1 | 247.9 | 296.8 | 38.9 | 45.4 | 162.5 | 40.9 | 83.5 | 1.0 | 19.0 | 33.2 | 76.3 | 43.7 | 13.5 | 1.8 | 12.2 | 8.0 | 3.0 | 4.3 | 0.6 |
| 152022 | 84.9 | 249.1 | 322.3 | 39.0 | 43.3 | 180.7 | 40.1 | 75.1 | 0.8 | 21.9 | 33.7 | 86.4 | 50.5 | 14.9 | 2.3 | 8.0 | 10.3 | 3.8 | 4.9 | 0.6 |
| 161655 | 81.6 | 273.5 | 332.8 | 46.4 | 43.8 | 191.8 | 38.6 | 79.8 | 1.0 | 22.0 | 31.5 | 79.8 | 46.5 | 13.6 | 1.8 | 9.5 | 6.1 | 3.0 | 4.0 | 0.8 |
| 148509 | 93.0 | 278.5 | 466.3 | 48.2 | 53.1 | 163.6 | 38.6 | 73.5 | 1.2 | 21.9 | 31.7 | 86.0 | 40.3 | 15.7 | 2.2 | 9.4 | 8.3 | 3.7 | 3.3 | 0.3 |
| 166160 | 92.4 | 314.3 | 396.3 | 43.4 | 56.4 | 185.0 | 38.8 | 78.6 | 1.3 | 27.3 | 34.5 | 75.6 | 57.4 | 17.4 | 2.1 | 13.0 | 8.3 | 3.9 | 3.3 | 0.3 |
| 149846 | 83.9 | 307.1 | 600.9 | 42.3 | 67.9 | 159.2 | 35.6 | 82.2 | 1.5 | 24.9 | 26.7 | 69.4 | 43.3 | 12.5 | 1.9 | 11.2 | 6.5 | 4.7 | 4.3 | 0.3 |
| 160551 | 81.3 | 266.5 | 467.1 | 41.8 | 40.4 | 180.5 | 37.8 | 84.2 | 1.7 | 29.2 | 28.7 | 79.2 | 51.9 | 8.2 | 2.7 | 9.3 | 6.9 | 3.7 | 3.4 | 0.3 |
| 146039 | 79.2 | 263.5 | 703.1 | 43.4 | 57.1 | 173.2 | 30.6 | 82.2 | 1.8 | 28.4 | 26.8 | 59.7 | 52.6 | 10.3 | 1.9 | 10.6 | 8.9 | 2.7 | 3.3 | 0.6 |
| 157706 | 81.6 | 284.6 | 632.7 | 34.9 | 55.8 | 177.4 | 32.3 | 77.4 | 1.4 | 27.8 | 29.9 | 61.9 | 44.2 | 9.8 | 2.3 | 12.4 | 5.8 | 2.6 | 2.7 | 0.5 |
| 139533 | 79.3 | 221.6 | 612.9 | 60.0 | 63.4 | 168.3 | 30.9 | 65.7 | 1.5 | 21.3 | 28.6 | 63.6 | 45.9 | 10.4 | 2.2 | 8.3 | 5.8 | 3.0 | 2.7 | 0.5 |
| 174356 | 95.7 | 255.4 | 808.2 | 49.9 | 67.4 | 177.1 | 33.2 | 86.9 | 1.3 | 21.3 | 29.5 | 66.9 | 63.6 | 10.1 | 1.9 | 9.0 | 6.8 | 2.8 | 3.8 | 0.4 |
| 145397 | 80.2 | 284.0 | 656.9 | 43.6 | 57.5 | 180.8 | 30.5 | 65.5 | 0.8 | 14.2 | 23.6 | 65.7 | 40.3 | 13.5 | 2.4 | 7.4 | 5.7 | 2.2 | 2.9 | 0.4 |
| 151558 | 81.0 | 262.6 | 651.4 | 45.1 | 64.5 | 173.4 | 28.3 | 65.9 | 0.6 | 10.1 | 19.7 | 50.0 | 46.3 | 10.5 | 2.3 | 9.0 | 6.0 | 2.7 | 3.1 | 0.3 |
| 128096 | 78.8 | 208.2 | 719.7 | 39.2 | 78.8 | 158.4 | 25.7 | 73.1 | 0.6 | 7.6 | 16.0 | 49.0 | 35.1 | 8.6 | 1.8 | 9.8 | 5.2 | 2.6 | 3.0 | 0.4 |
| 141978 | 87.6 | 229.5 | 976.7 | 37.6 | 88.5 | 170.3 | 28.6 | 65.7 | 0.6 | 6.0 | 18.2 | 49.5 | 43.2 | 10.2 | 2.9 | 10.3 | 3.8 | 3.2 | 3.0 | 0.2 |
| 163591 | 81.4 | 191.4 | 859.3 | 35.1 | 58.3 | 140.0 | 25.5 | 58.3 | 0.4 | 4.2 | 17.6 | 45.6 | 38.3 | 8.9 | 1.3 | 5.9 | 5.9 | 2.7 | 1.9 | 0.4 |
| 177903 | 95.9 | 197.2 | 861.8 | 43.7 | 55.4 | 159.2 | 27.1 | 66.2 | 0.5 | 4.5 | 15.1 | 44.9 | 36.5 | 8.0 | 2.0 | 6.9 | 4.8 | 3.1 | 1.6 | 0.3 |
| 159212 | 97.7 | 243.0 | 1657.5 | 43.8 | 86.8 | 170.5 | 25.6 | 57.5 | 0.4 | 6.8 | 15.2 | 40.1 | 32.7 | 10.3 | 1.8 | 6.5 | 7.1 | 2.4 | 2.6 | 0.3 |
| 151783 | 91.5 | 193.3 | 908.0 | 33.4 | 83.2 | 145.1 | 21.1 | 53.2 | 0.8 | 9.7 | 13.0 | 31.2 | 27.6 | 7.5 | 1.0 | 5.5 | 4.4 | 1.8 | 1.4 | 0.2 |
| 128119 | 84.9 | 215.3 | 624.2 | 43.0 | 54.3 | 151.2 | 19.7 | 46.9 | 0.7 | 9.7 | 8.4 | 26.7 | 24.3 | 5.2 | 1.1 | 3.7 | 3.2 | 1.0 | 1.1 | 0.2 |
| 160918 | 98.2 | 159.6 | 604.4 | 23.0 | 46.7 | 150.8 | 18.4 | 50.9 | 1.0 | 10.2 | 8.3 | 29.4 | 15.6 | 5.9 | 1.0 | 5.1 | 2.5 | 0.5 | 2.4 | 0.3 |
| 173101 | 109.3 | 170.1 | 1013.2 | 27.4 | 70.2 | 148.9 | 22.0 | 60.5 | 1.0 | 11.4 | 9.6 | 28.9 | 23.0 | 3.8 | 0.8 | 2.1 | 3.6 | 2.2 | <LOD | <LOD |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GAT2.1.1track1 | | | | | | | | | | | | | | | | | | | | |
| 19427 | 6.2 | 57.3 | <LOD | 8.8 | <LOD | 500.2 | 20.1 | 227.7 | 27.2 | 763.4 | 64.7 | 114.1 | 36.4 | 8.9 | 0.9 | 4.1 | 4.9 | 2.5 | 2.2 | 0.3 |
| 14154 | 4.7 | 54.9 | <LOD | 6.2 | <LOD | 499.2 | 19.2 | 179.2 | 24.3 | 727.8 | 59.3 | 100.7 | 31.6 | 6.3 | 0.7 | 2.6 | 4.0 | 1.3 | 2.7 | 0.1 |
| 16757 | 5.0 | 56.8 | <LOD | 9.1 | <LOD | 488.2 | 19.7 | 176.3 | 24.2 | 707.8 | 55.3 | 95.5 | 27.4 | 5.4 | 0.4 | 4.7 | 3.3 | 2.3 | 1.5 | 0.4 |
| 18059 | 6.2 | 55.5 | <LOD | 9.7 | <LOD | 565.7 | 22.6 | 217.7 | 27.0 | 784.2 | 74.0 | 127.5 | 40.5 | 9.1 | 1.0 | 5.6 | 3.0 | 2.7 | 3.4 | 0.4 |
| 23334 | 5.7 | 54.9 | <LOD | 7.4 | <LOD | 513.1 | 21.3 | 184.2 | 26.1 | 745.5 | 67.3 | 122.0 | 43.9 | 8.1 | 0.8 | 5.7 | 4.0 | 2.7 | 2.6 | 0.3 |
| 28978 | 6.3 | 69.8 | <LOD | 10.8 | <LOD | 583.6 | 23.4 | 193.2 | 26.9 | 779.4 | 77.3 | 134.9 | 44.2 | 11.0 | 1.7 | 5.7 | 5.2 | 1.9 | 3.9 | 0.4 |
| 23561 | 8.4 | 59.9 | <LOD | 10.3 | 5.4 | 499.8 | 25.0 | 182.8 | 24.6 | 693.8 | 69.5 | 128.0 | 47.5 | 9.5 | 1.4 | 6.2 | 4.2 | 2.4 | 3.6 | 0.5 |
| 44201 | 14.7 | 90.0 | <LOD | 13.4 | 14.0 | 486.1 | 27.9 | 205.5 | 24.6 | 644.4 | 73.2 | 131.5 | 56.5 | 8.4 | 1.5 | 7.2 | 4.9 | 2.5 | 2.9 | 0.6 |
| 46137 | 19.5 | 100.1 | <LOD | 16.4 | 12.6 | 428.3 | 31.6 | 168.3 | 19.6 | 559.8 | 66.2 | 132.3 | 58.1 | 10.8 | 1.8 | 10.3 | 7.5 | 4.5 | 4.2 | 0.5 |
| 69518 | 31.3 | 120.7 | <LOD | 24.1 | 14.7 | 416.3 | 33.5 | 158.8 | 17.5 | 457.1 | 74.9 | 144.0 | 64.5 | 10.3 | 1.9 | 9.9 | 7.2 | 3.6 | 3.4 | 0.5 |
| 94345 | 38.8 | 180.7 | <LOD | 28.3 | 18.6 | 399.4 | 44.7 | 136.6 | 13.5 | 370.4 | 81.4 | 170.7 | 79.3 | 12.9 | 2.3 | 13.6 | 10.4 | 5.5 | 4.8 | 0.5 |
| 101132 | 38.6 | 161.7 | 22.3 | 32.1 | 18.0 | 346.0 | 46.4 | 122.3 | 9.8 | 255.5 | 72.8 | 148.8 | 68.8 | 13.2 | 2.4 | 11.1 | 12.8 | 4.4 | 3.0 | 0.5 |
| 119385 | 44.8 | 189.8 | <LOD | 44.3 | 26.9 | 423.8 | 52.3 | 112.7 | 7.2 | 186.8 | 64.9 | 149.4 | 77.1 | 16.1 | 2.3 | 13.7 | 13.4 | 6.9 | 4.1 | 0.7 |
| 124753 | 54.4 | 229.3 | 28.0 | 48.4 | 34.2 | 264.3 | 50.0 | 91.2 | 4.6 | 116.7 | 46.1 | 119.1 | 72.4 | 17.1 | 2.0 | 10.7 | 12.5 | 5.4 | 5.8 | 0.7 |
| 136866 | 56.0 | 205.4 | 33.3 | 40.1 | 37.1 | 193.3 | 52.0 | 73.6 | 2.9 | 68.1 | 40.6 | 90.0 | 62.2 | 14.6 | 1.9 | 13.5 | 10.4 | 4.4 | 3.1 | 0.5 |
| 153239 | 58.7 | 231.3 | 31.9 | 35.3 | 33.5 | 172.7 | 51.5 | 67.9 | 1.7 | 40.6 | 28.6 | 85.4 | 70.6 | 14.1 | 1.9 | 10.6 | 11.8 | 6.0 | 5.4 | 0.7 |
| 155657 | 62.2 | 299.6 | 31.7 | 52.3 | 29.2 | 166.6 | 57.2 | 65.2 | 1.2 | 23.2 | 27.8 | 80.3 | 55.1 | 18.7 | 1.7 | 15.4 | 8.9 | 3.6 | 3.4 | 0.7 |
| 133422 | 62.9 | 258.2 | 29.5 | 44.7 | 36.4 | 144.6 | 47.9 | 63.9 | 0.6 | 15.1 | 25.3 | 74.3 | 67.2 | 13.9 | 1.7 | 10.7 | 10.8 | 4.6 | 3.6 | 0.5 |
| 155612 | 64.8 | 283.2 | 59.4 | 52.7 | 49.3 | 148.5 | 50.5 | 69.9 | 0.6 | 10.5 | 21.4 | 77.4 | 54.9 | 11.1 | 1.8 | 12.9 | 11.9 | 4.7 | 5.3 | 0.4 |
| 145255 | 68.4 | 260.5 | 51.6 | 47.8 | 68.0 | 154.6 | 45.9 | 72.0 | 0.7 | 7.2 | 19.9 | 67.8 | 60.3 | 14.0 | 1.6 | 12.2 | 10.4 | 4.6 | 3.2 | 0.5 |
| 145004 | 67.5 | 293.0 | 36.0 | 50.9 | 44.1 | 153.9 | 48.6 | 79.0 | 0.4 | 5.3 | 21.1 | 71.8 | 60.7 | 15.6 | 1.8 | 9.9 | 8.1 | 4.8 | 5.0 | 0.3 |
| 178557 | 86.4 | 301.8 | 31.5 | 50.7 | 41.4 | 170.4 | 44.9 | 92.6 | 0.7 | 4.0 | 21.8 | 70.6 | 56.4 | 12.8 | 3.1 | 13.2 | 10.4 | 5.0 | 4.5 | 0.3 |
| 168587 | 77.7 | 269.2 | 43.2 | 54.5 | 51.3 | 170.3 | 43.6 | 112.4 | 0.7 | 3.7 | 22.3 | 68.5 | 61.5 | 12.1 | 2.5 | 14.3 | 10.9 | 5.4 | 5.7 | 0.9 |
| 166526 | 90.6 | 274.6 | <LOD | 43.3 | 37.6 | 163.7 | 43.8 | 123.7 | 0.5 | 3.1 | 25.8 | 77.8 | 64.6 | 13.2 | 2.8 | 14.6 | 10.4 | 4.6 | 3.5 | 0.5 |
| 169363 | 84.6 | 288.1 | 36.2 | 52.8 | 43.8 | 180.1 | 50.3 | 136.6 | 0.8 | 2.4 | 23.1 | 67.2 | 54.1 | 13.4 | 2.8 | 10.1 | 8.2 | 4.9 | 5.1 | 0.5 |
| 170752 | 87.7 | 263.2 | 42.4 | 48.7 | 43.5 | 180.2 | 38.3 | 127.6 | 0.7 | 2.7 | 22.0 | 71.7 | 55.7 | 13.4 | 3.3 | 10.1 | 9.2 | 4.9 | 3.0 | 0.7 |
| 162643 | 82.5 | 269.7 | 55.0 | 49.8 | 73.8 | 194.8 | 43.1 | 126.2 | 0.9 | 6.9 | 20.9 | 72.2 | 54.3 | 13.1 | 2.2 | 13.5 | 5.9 | 4.1 | 3.0 | 0.3 |
| 172120 | 101.4 | 224.6 | 152.1 | 51.9 | 62.5 | 179.4 | 39.9 | 115.2 | 0.9 | 10.5 | 22.7 | 65.1 | 45.2 | 13.2 | 2.3 | 8.2 | 7.1 | 4.2 | 3.1 | 0.5 |
| 157215 | 107.0 | 260.9 | 131.2 | 44.9 | 75.6 | 171.7 | 31.0 | 104.6 | 0.8 | 11.6 | 16.8 | 55.9 | 36.2 | 9.0 | 2.1 | 11.0 | 7.2 | 2.5 | 1.7 | 0.4 |
| 146660 | 95.8 | 215.9 | 141.8 | 50.5 | 74.7 | 170.9 | 30.2 | 90.1 | 1.1 | 11.8 | 14.4 | 38.8 | 33.5 | 6.5 | 1.6 | 5.5 | 6.2 | 1.9 | 1.5 | 0.3 |
| 156756 | 109.1 | 199.7 | 148.3 | 44.4 | 78.1 | 197.6 | 35.6 | 113.5 | 1.2 | 17.4 | 14.3 | 47.1 | 29.7 | 7.4 | 1.9 | 6.8 | 6.1 | 3.6 | 1.7 | 0.5 |
| 147460 | 116.9 | 197.5 | 233.5 | 33.3 | 35.0 | 177.5 | 25.3 | 98.7 | 0.8 | 15.0 | 11.8 | 42.1 | 21.6 | 8.0 | 1.3 | 3.7 | 2.8 | 1.3 | <LOD | <LOD |
| 180216 | 114.4 | 224.3 | <LOD | 53.4 | 58.1 | 182.5 | 39.4 | 98.6 | <LOD | 19.1 | 22.2 | 50.3 | 39.1 | 8.9 | 1.8 | <LOD | 4.0 | <LOD | <LOD | <LOD |
| GAT2.1.2track1 | | | | | | | | | | | | | | | | | | | | |
| 19800 | 8.1 | 60.2 | <LOD | 10.8 | <LOD | 493.6 | 19.3 | 216.2 | 25.5 | 721.0 | 58.3 | 104.2 | 35.6 | 8.3 | 1.1 | 3.5 | 3.6 | 1.3 | 1.7 | 0.4 |
| 14172 | 5.5 | 58.7 | <LOD | 7.9 | <LOD | 480.8 | 17.4 | 180.7 | 23.5 | 689.3 | 53.9 | 87.5 | 31.3 | 4.6 | 0.8 | 3.8 | 3.7 | 1.6 | 2.1 | 0.2 |
| 14954 | 5.5 | 61.8 | <LOD | 6.9 | <LOD | 480.1 | 17.5 | 192.0 | 26.2 | 751.4 | 54.6 | 102.9 | 30.3 | 5.8 | 0.8 | 4.0 | 2.4 | 1.6 | 2.6 | 0.4 |
| 16911 | 6.0 | 54.9 | <LOD | 8.3 | <LOD | 513.9 | 18.6 | 191.3 | 25.5 | 726.5 | 61.3 | 101.7 | 30.2 | 7.7 | 1.0 | 4.1 | 4.0 | 2.2 | 2.8 | 0.1 |
| 18029 | 6.5 | 51.8 | <LOD | 9.6 | <LOD | 480.7 | 18.6 | 180.7 | 25.1 | 740.3 | 60.5 | 104.5 | 31.2 | 5.2 | 0.7 | 3.6 | 3.3 | 1.9 | 2.5 | 0.3 |
| 24193 | 9.2 | 76.9 | <LOD | 8.9 | <LOD | 499.4 | 20.5 | 188.9 | 27.0 | 716.0 | 60.1 | 101.3 | 32.3 | 6.6 | 1.2 | 5.4 | 2.6 | 1.3 | 3.3 | 0.3 |
| 31173 | 11.3 | 73.0 | <LOD | 15.2 | <LOD | 464.9 | 21.4 | 195.4 | 23.9 | 677.4 | 56.2 | 107.2 | 38.3 | 7.9 | 0.8 | 4.4 | 4.2 | 2.5 | 2.9 | 0.4 |
| 35737 | 15.9 | 88.1 | <LOD | 13.5 | 6.0 | 445.9 | 23.6 | 199.7 | 22.6 | 581.3 | 55.0 | 97.8 | 41.7 | 8.4 | 0.8 | 5.7 | 4.1 | 2.8 | 1.7 | 0.2 |
| 49222 | 19.1 | 105.6 | <LOD | 15.1 | 9.7 | 400.6 | 28.3 | 159.2 | 20.2 | 545.2 | 59.7 | 114.2 | 50.5 | 7.3 | 1.3 | 6.9 | 6.0 | 3.5 | 3.3 | 0.6 |
| 75138 | 32.3 | 125.3 | <LOD | 25.5 | 19.6 | 391.8 | 30.8 | 158.4 | 18.0 | 464.9 | 49.8 | 106.9 | 43.3 | 8.8 | 1.0 | 6.8 | 6.8 | 3.6 | 3.5 | 0.6 |
| 92303 | 39.3 | 163.7 | <LOD | 25.9 | 26.7 | 323.1 | 36.4 | 143.8 | 12.5 | 375.1 | 46.4 | 96.7 | 43.2 | 9.8 | 1.3 | 8.9 | 6.6 | 3.6 | 4.9 | 0.5 |
| 87136 | 37.6 | 151.8 | <LOD | 28.7 | 20.5 | 275.8 | 36.4 | 120.3 | 10.5 | 271.0 | 36.1 | 85.0 | 39.7 | 10.6 | 1.6 | 7.8 | 7.4 | 4.0 | 2.9 | 0.6 |
| 94548 | 42.7 | 159.7 | <LOD | 38.4 | 39.3 | 244.9 | 41.7 | 104.7 | 8.6 | 213.4 | 36.4 | 89.3 | 46.0 | 7.3 | 1.5 | 10.4 | 9.8 | 4.1 | 5.2 | 0.4 |
| 110250 | 51.4 | 217.4 | <LOD | 49.5 | 32.4 | 238.3 | 43.9 | 102.7 | 6.4 | 158.7 | 28.6 | 82.5 | 54.5 | 13.8 | 2.0 | 8.1 | 9.2 | 3.4 | 3.4 | 0.6 |
| 120891 | 57.4 | 195.2 | 35.3 | 35.4 | 28.4 | 184.9 | 45.8 | 76.9 | 4.9 | 100.6 | 27.7 | 68.0 | 47.1 | 12.0 | 1.0 | 10.0 | 8.8 | 4.8 | 3.2 | 0.7 |
| 147139 | 57.4 | 249.7 | 26.8 | 35.2 | 33.2 | 171.0 | 48.3 | 72.3 | 2.8 | 65.0 | 22.3 | 73.0 | 52.2 | 13.5 | 1.7 | 9.6 | 9.4 | 5.6 | 4.9 | 0.8 |
| 141258 | 60.8 | 280.5 | 43.0 | 47.6 | 40.1 | 168.3 | 54.6 | 75.4 | 1.8 | 40.9 | 27.2 | 71.6 | 53.3 | 16.2 | 2.8 | 12.9 | 10.2 | 7.4 | 5.4 | 0.8 |
| 145237 | 60.3 | 257.5 | 43.8 | 45.2 | 49.7 | 156.5 | 45.4 | 78.9 | 1.1 | 27.5 | 22.7 | 69.4 | 57.1 | 13.0 | 2.2 | 10.8 | 10.8 | 6.1 | 3.9 | 0.8 |
| 140924 | 64.1 | 293.3 | 54.1 | 47.6 | 32.8 | 148.7 | 44.1 | 77.6 | 1.0 | 20.9 | 21.6 | 77.8 | 53.3 | 11.8 | 2.3 | 13.9 | 9.4 | 3.9 | 4.0 | 0.7 |
| 143866 | 69.8 | 265.3 | 61.2 | 45.5 | 80.2 | 164.9 | 44.4 | 79.7 | 1.0 | 17.8 | 20.2 | 69.1 | 64.3 | 16.4 | 2.4 | 12.0 | 9.3 | 5.7 | 3.1 | 1.0 |
| 135423 | 71.9 | 306.9 | 41.5 | 42.4 | 36.7 | 149.4 | 47.7 | 83.4 | 0.7 | 16.4 | 20.4 | 66.9 | 64.6 | 17.8 | 1.9 | 10.8 | 10.0 | 4.4 | 5.1 | 0.7 |
| 159896 | 82.2 | 286.6 | 52.8 | 52.7 | 57.6 | 176.1 | 46.1 | 97.1 | 0.9 | 14.1 | 22.4 | 67.4 | 61.6 | 15.4 | 2.0 | 12.2 | 10.1 | 4.6 | 4.1 | 0.5 |
| 158696 | 74.4 | 285.6 | 65.5 | 49.7 | 60.3 | 183.1 | 44.1 | 107.0 | 0.8 | 14.1 | 22.6 | 65.6 | 50.5 | 15.1 | 2.5 | 11.1 | 9.5 | 5.2 | 4.5 | 0.6 |
| 165625 | 84.4 | 255.6 | 36.9 | 39.8 | 58.9 | 163.3 | 50.3 | 108.5 | 0.9 | 12.1 | 21.4 | 68.9 | 58.5 | 12.8 | 1.9 | 9.9 | 9.3 | 3.8 | 4.9 | 0.3 |
| 157149 | 83.4 | 299.4 | 45.8 | 47.8 | 55.3 | 177.9 | 44.1 | 119.5 | 0.9 | 10.5 | 21.6 | 65.1 | 60.5 | 10.1 | 2.8 | 11.1 | 7.7 | 4.9 | 4.8 | 0.6 |
| 168012 | 84.0 | 246.0 | 45.5 | 42.8 | 42.9 | 180.4 | 36.1 | 126.9 | 0.7 | 9.3 | 20.8 | 67.8 | 59.2 | 10.0 | 2.8 | 11.3 | 9.0 | 4.3 | 2.6 | 0.5 |
| 165587 | 84.5 | 279.3 | 45.1 | 45.3 | 77.1 | 181.1 | 39.6 | 115.7 | 0.8 | 8.3 | 19.9 | 66.5 | 43.8 | 12.8 | 2.2 | 8.6 | 9.7 | 3.8 | 2.7 | 0.6 |
| 169650 | 84.8 | 214.3 | 111.4 | 50.6 | 64.7 | 177.5 | 37.3 | 109.5 | 0.8 | 9.4 | 20.7 | 60.6 | 44.5 | 10.7 | 2.2 | 8.5 | 6.4 | 2.2 | 3.7 | 0.3 |
| 175364 | 97.1 | 269.7 | 66.4 | 47.4 | 73.2 | 194.6 | 33.2 | 115.8 | 0.7 | 9.2 | 21.0 | 63.9 | 48.6 | 14.1 | 2.4 | 8.6 | 7.4 | 2.8 | 3.0 | 0.3 |
| 162059 | 90.7 | 214.1 | 83.9 | 54.3 | 90.4 | 172.2 | 31.3 | 101.5 | 0.6 | 8.3 | 16.7 | 50.0 | 35.2 | 13.6 | 2.1 | 6.3 | 6.7 | 3.4 | 2.1 | 0.4 |
| 139541 | 96.9 | 179.0 | 142.7 | 40.0 | 66.4 | 186.1 | 25.7 | 102.1 | 0.7 | 7.4 | 14.4 | 45.5 | 35.2 | 9.3 | 2.0 | 8.2 | 5.0 | 2.1 | 2.0 | 0.3 |
| 171925 | 114.6 | 197.7 | 413.4 | 44.0 | 76.0 | 185.4 | 24.9 | 88.7 | 0.5 | 7.2 | 13.4 | 43.3 | 38.3 | 10.5 | 1.6 | 7.5 | 4.6 | 2.0 | 1.6 | 0.3 |
| 160015 | 93.0 | 153.0 | 253.8 | 46.2 | 60.2 | 173.7 | 22.8 | 67.0 | 0.6 | 6.5 | 13.0 | 39.2 | 28.4 | 8.9 | 1.2 | 6.1 | 5.5 | 1.6 | 2.1 | 0.3 |
| 160101 | 95.0 | 161.2 | 678.2 | 44.3 | 74.8 | 174.9 | 23.1 | 67.1 | 0.4 | 5.7 | 10.5 | 37.4 | 26.7 | 7.2 | 2.4 | 5.9 | 4.6 | 1.6 | 1.9 | 0.3 |
| 155089 | 100.0 | 166.0 | 410.8 | 36.4 | 94.2 | 161.6 | 18.8 | 62.8 | 0.4 | 4.7 | 8.6 | 30.5 | 23.5 | 7.5 | 1.2 | 4.8 | 4.0 | 1.1 | 1.6 | 0.1 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 133468 | 103.7 | 143.9 | 787.9 | 30.5 | 125.1 | 154.1 | 16.9 | 61.6 | 0.3 | 5.0 | 8.1 | 26.4 | 21.2 | 5.9 | 1.3 | 3.5 | 3.1 | 1.4 | 1.2 | 0.1 |
| 158316 | 105.3 | 129.8 | 560.2 | 34.5 | 76.9 | 167.7 | 15.1 | 48.1 | 0.3 | 5.0 | 7.7 | 28.7 | 19.8 | 7.8 | 1.5 | 5.6 | 4.1 | 1.9 | 1.5 | 0.2 |
| 180694 | 114.1 | 145.4 | 1478.6 | 36.9 | 71.8 | 157.3 | 16.8 | 49.7 | 0.4 | 5.7 | 8.4 | 28.9 | 28.4 | 6.6 | 0.8 | 6.2 | 3.8 | 1.6 | 1.6 | 0.2 |
| 168013 | 121.6 | 126.9 | 728.7 | 31.7 | 104.8 | 160.0 | 13.8 | 43.9 | 0.2 | 5.6 | 9.6 | 29.1 | 20.3 | 4.3 | 1.4 | 4.2 | 3.8 | 1.6 | 1.8 | 0.2 |
| 157914 | 117.4 | 123.7 | 617.4 | 43.0 | 102.6 | 157.4 | 18.0 | 46.3 | 0.4 | 5.7 | 7.3 | 23.7 | 22.7 | 6.8 | 1.3 | 6.3 | 4.0 | 1.5 | 0.5 | 0.2 |
| 126033 | 112.7 | 112.1 | 580.5 | 33.2 | 81.3 | 136.0 | 14.2 | 33.3 | 0.2 | 5.1 | 6.9 | 22.7 | 21.9 | 5.1 | 1.1 | 3.4 | 3.6 | 1.1 | 0.6 | 0.2 |
| 157724 | 106.9 | 99.4 | 893.5 | 31.1 | 96.5 | 139.7 | 14.1 | 37.3 | 0.3 | 5.3 | 5.7 | 23.8 | 20.2 | 3.8 | 0.9 | 4.0 | 3.4 | 1.2 | 1.7 | 0.2 |
| 162152 | 120.9 | 92.8 | 814.2 | 38.3 | 106.3 | 157.3 | 14.3 | 40.0 | 0.4 | 6.4 | 8.1 | 22.4 | 17.7 | 5.0 | 1.1 | 3.8 | 4.0 | 1.2 | 1.0 | 0.1 |
| 152767 | 109.5 | 110.7 | 678.6 | 28.4 | 96.2 | 135.2 | 13.8 | 46.3 | 0.3 | 5.3 | 7.0 | 18.5 | 16.4 | 5.1 | 1.2 | 5.5 | 2.7 | 0.8 | 0.5 | 0.1 |
| 132572 | 113.9 | 97.8 | 1090.9 | 33.3 | 90.0 | 143.3 | 12.3 | 38.4 | 0.2 | 4.7 | 5.6 | 19.4 | 19.4 | 3.9 | 0.8 | 3.0 | 3.9 | 0.8 | 0.5 | <LOD |
| 157538 | 123.1 | 106.4 | 883.2 | 32.2 | 79.2 | 147.5 | 16.1 | 37.0 | 0.2 | 4.5 | 7.6 | 20.4 | 19.6 | 6.2 | 1.2 | 4.0 | 3.3 | 1.2 | 1.2 | 0.1 |
| 169499 | 106.7 | 113.2 | 1522.6 | 36.6 | 64.1 | 141.1 | 12.3 | 31.5 | 0.3 | 4.1 | 5.9 | 20.4 | 16.5 | 4.6 | 0.9 | 2.8 | 2.4 | 1.0 | 1.7 | <LOD |
| 152761 | 101.2 | 92.7 | 604.3 | 40.1 | 66.3 | 148.2 | 11.6 | 27.6 | 0.2 | 4.0 | 5.6 | 23.6 | 15.5 | 4.8 | 1.0 | 3.5 | 3.8 | 1.5 | 1.3 | 0.3 |
| 155982 | 110.6 | 91.8 | 1053.2 | 42.5 | 90.4 | 166.4 | 14.4 | 36.3 | 0.3 | 4.4 | 8.1 | 25.3 | 20.4 | 7.0 | 1.4 | 5.2 | 3.3 | 2.3 | 1.6 | 0.3 |
| 138290 | 107.2 | 92.9 | 676.3 | 35.8 | 114.9 | 140.9 | 13.4 | 33.2 | 0.2 | 3.8 | 8.0 | 26.4 | 24.4 | 7.3 | 1.3 | 4.2 | 2.5 | 1.7 | 1.5 | 0.1 |
| 160274 | 98.6 | 112.2 | 389.4 | 36.8 | 74.3 | 152.0 | 17.6 | 39.9 | 0.2 | 3.6 | 8.7 | 27.8 | 24.1 | 5.9 | 1.6 | 4.2 | 4.1 | 1.8 | 2.4 | 0.2 |
| 155762 | 97.4 | 116.6 | 344.3 | 33.1 | 39.6 | 158.3 | 16.5 | 42.9 | 0.2 | 3.6 | 9.4 | 32.0 | 27.2 | 9.1 | 1.4 | 5.4 | 4.6 | 1.7 | 1.2 | 0.4 |
| 165637 | 95.8 | 143.3 | 434.9 | 42.9 | 49.6 | 180.5 | 21.4 | 44.8 | 0.3 | 4.3 | 10.8 | 37.9 | 27.3 | 10.6 | 1.7 | 5.5 | 5.5 | 2.6 | 2.1 | 0.2 |
| 170514 | 101.4 | 136.2 | 295.0 | 43.2 | 40.3 | 178.3 | 26.4 | 58.5 | 0.4 | 7.7 | 11.4 | 36.6 | 37.2 | 10.6 | 1.4 | 7.3 | 4.5 | 2.4 | 2.9 | 0.3 |
| 150384 | 91.6 | 135.2 | 289.5 | 29.7 | 63.7 | 164.0 | 23.6 | 53.0 | 0.8 | 20.6 | 12.1 | 43.5 | 25.9 | 10.3 | 1.5 | 8.3 | 5.6 | 2.1 | 2.3 | 0.3 |
| 149443 | 79.5 | 137.5 | 210.2 | 45.8 | 53.3 | 185.0 | 24.7 | 60.1 | 1.8 | 48.0 | 15.2 | 48.3 | 41.7 | 6.6 | 1.6 | 7.1 | 6.0 | 2.3 | 2.0 | 0.2 |
| 157160 | 81.4 | 180.6 | 254.5 | 48.0 | 63.1 | 204.4 | 27.9 | 82.7 | 3.1 | 95.4 | 22.0 | 51.4 | 41.4 | 8.0 | 1.8 | 6.3 | 5.2 | 2.6 | 3.4 | 0.4 |
| 152506 | 75.9 | 205.9 | 199.3 | 35.9 | 58.3 | 222.8 | 28.9 | 76.7 | 5.0 | 138.0 | 24.3 | 62.0 | 30.8 | 9.6 | 1.7 | 7.8 | 5.8 | 2.5 | 2.6 | 0.4 |
| 145786 | 74.6 | 241.1 | 349.2 | 38.6 | 41.2 | 231.8 | 30.2 | 103.6 | 6.3 | 159.6 | 21.2 | 56.2 | 36.3 | 7.8 | 1.5 | 6.1 | 4.5 | 1.8 | 2.5 | 0.4 |
| 129092 | 65.0 | 344.0 | 304.8 | 57.3 | 66.9 | 231.5 | 26.5 | 88.5 | 7.9 | 175.2 | 24.5 | 60.0 | 34.0 | 7.7 | 1.7 | 7.5 | 6.0 | 2.1 | 2.8 | 0.6 |
| 114195 | 62.2 | 536.0 | 428.8 | 52.6 | 102.8 | 216.8 | 25.4 | 105.3 | 7.9 | 198.5 | 25.7 | 59.9 | 36.9 | 7.6 | 1.5 | 7.7 | 3.9 | 2.0 | 3.2 | 0.3 |
| 121768 | 73.3 | 565.9 | 572.8 | 56.6 | 70.4 | 261.6 | 27.9 | 118.6 | 9.2 | 235.7 | 27.6 | 68.7 | 39.7 | 8.2 | 1.7 | 9.1 | 6.0 | 3.5 | 3.0 | 0.3 |
| 125475 | 67.7 | 627.2 | 635.7 | 49.9 | 58.6 | 284.7 | 25.3 | 125.0 | 11.0 | 269.1 | 31.2 | 65.4 | 45.6 | 8.9 | 1.5 | 6.3 | 7.2 | 2.7 | 3.6 | 0.3 |
| 116968 | 67.8 | 451.5 | 452.4 | 49.7 | 50.6 | 282.7 | 27.1 | 124.6 | 10.3 | 280.9 | 30.4 | 66.4 | 39.4 | 11.0 | 1.4 | 7.1 | 5.1 | 3.5 | 2.1 | 0.3 |
| 101051 | 67.2 | 278.0 | 227.6 | 43.9 | 52.9 | 294.0 | 25.5 | 110.7 | 10.6 | 304.9 | 27.8 | 64.1 | 35.7 | 7.3 | 1.4 | 7.0 | 4.9 | 2.2 | 3.8 | 0.6 |
| 98613 | 63.9 | 291.7 | 280.0 | 30.5 | 69.5 | 296.3 | 26.2 | 103.8 | 10.4 | 308.5 | 30.2 | 60.9 | 31.2 | 6.5 | 1.0 | 8.8 | 5.8 | 3.2 | 1.2 | 0.2 |
| 112192 | 63.7 | 198.4 | 215.3 | 34.2 | 47.8 | 318.5 | 25.1 | 116.8 | 10.5 | 325.7 | 32.9 | 66.0 | 37.4 | 8.3 | 1.3 | 5.8 | 4.5 | 1.9 | 3.1 | 0.3 |
| 103440 | 62.2 | 155.4 | 204.7 | 31.4 | 31.7 | 316.8 | 25.8 | 101.1 | 10.3 | 312.4 | 28.3 | 59.6 | 34.9 | 5.7 | 1.2 | 6.9 | 5.8 | 1.7 | 0.6 | 0.3 |
| 104187 | 57.4 | 157.5 | 143.7 | 32.7 | 29.8 | 318.2 | 24.8 | 113.2 | 11.0 | 319.1 | 28.8 | 63.0 | 39.1 | 6.4 | 1.5 | 6.4 | 5.0 | 2.8 | 1.6 | 0.3 |
| 96809 | 59.2 | 167.9 | 139.4 | 29.7 | 36.1 | 324.6 | 25.3 | 121.5 | 10.7 | 312.8 | 30.7 | 61.8 | 37.8 | 7.7 | 1.5 | 5.2 | 3.8 | 1.3 | 2.4 | 0.3 |
| 106752 | 57.9 | 129.4 | 198.6 | 31.1 | 36.9 | 303.1 | 23.5 | 121.3 | 9.6 | 264.2 | 24.5 | 52.8 | 29.6 | 7.7 | 1.0 | 4.6 | 3.3 | 1.5 | 1.7 | 0.2 |
| 107062 | 60.9 | 134.6 | 175.6 | 27.6 | 22.8 | 275.8 | 20.7 | 100.6 | 8.3 | 233.0 | 19.7 | 44.9 | 22.8 | 4.2 | 1.3 | 6.4 | 2.5 | 1.0 | 1.7 | <LOD |
| 98964 | 55.2 | 152.0 | 112.8 | 28.5 | 48.9 | 298.0 | 23.3 | 97.5 | 9.0 | 243.2 | 22.3 | 39.1 | 18.8 | 2.4 | <LOD | 5.9 | 4.0 | 1.0 | 2.1 | <LOD |
| 84228 | 63.3 | 134.9 | | 17.1 | 60.3 | 303.3 | 25.9 | 101.3 | 8.0 | 225.5 | 21.3 | 45.7 | 32.7 | 5.1 | <LOD | 6.9 | 2.6 | <LOD | <LOD | <LOD |
| 119778 | 64.2 | 124.7 | | 38.8 | | 411.9 | 34.9 | 100.9 | 12.4 | 306.9 | 32.1 | 60.9 | 23.8 | <LOD | <LOD | <LOD | <LOD | 5.3 | <LOD | <LOD |
| 60464 | | 134.0 | | | | 270.5 | 11.6 | 110.6 | 8.0 | 208.8 | 22.7 | 41.5 | 41.7 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD |
| <LOD | | 144.5 | | | | 324.9 | 17.0 | 113.2 | 7.8 | 234.2 | 28.0 | 51.2 | <LOD | <LOD | <LOD | 23.1 | <LOD | <LOD | <LOD | <LOD |
| GAT2.9.2track1 | | | | | | | | | | | | | | | | | | | | |
| 17634 | 5.8 | 63.5 | <LOD | 7.1 | <LOD | 390.4 | 24.4 | 224.9 | 27.3 | 538.1 | 63.0 | 120.0 | 37.0 | 9.2 | 1.0 | 4.7 | 3.7 | 1.9 | 1.7 | 0.3 |
| 14200 | 6.4 | 55.2 | <LOD | 10.3 | <LOD | 384.6 | 19.2 | 203.7 | 25.3 | 533.4 | 63.4 | 101.1 | 32.4 | 7.3 | 1.0 | 3.0 | 3.8 | 3.0 | 2.0 | 0.3 |
| 18647 | 5.9 | 75.8 | <LOD | 8.3 | <LOD | 387.8 | 21.1 | 204.0 | 29.3 | 548.9 | 63.5 | 116.9 | 33.8 | 7.5 | 0.9 | 6.0 | 3.8 | 1.2 | 2.0 | 0.3 |
| 16993 | 6.2 | 62.8 | <LOD | 10.8 | <LOD | 432.2 | 21.2 | 231.1 | 30.5 | 544.7 | 74.6 | 123.2 | 38.7 | 8.7 | 1.1 | 3.8 | 3.5 | 1.3 | 1.4 | 0.5 |
| 18101 | 6.1 | 58.0 | <LOD | 10.8 | <LOD | 391.5 | 20.4 | 194.7 | 28.6 | 518.5 | 67.2 | 111.0 | 35.5 | 5.6 | 0.7 | 4.5 | 3.1 | 1.4 | 1.3 | 0.3 |
| 20509 | 6.3 | 80.3 | <LOD | 11.4 | <LOD | 403.5 | 20.2 | 205.4 | 27.2 | 503.8 | 66.8 | 109.6 | 36.4 | 5.3 | 0.9 | 5.8 | 3.5 | 2.1 | 2.3 | 0.3 |
| 18805 | 7.3 | 62.6 | <LOD | 11.3 | <LOD | 339.6 | 19.4 | 200.7 | 27.1 | 480.5 | 61.9 | 110.4 | 35.9 | 7.9 | 0.9 | 4.3 | 2.7 | 1.5 | 2.0 | 0.4 |
| 19049 | 7.1 | 62.6 | <LOD | 8.7 | <LOD | 334.8 | 19.4 | 228.9 | 26.9 | 436.0 | 62.9 | 107.0 | 39.2 | 6.3 | 0.8 | 3.8 | 3.5 | 1.9 | 2.6 | 0.3 |
| 18106 | 8.6 | 72.4 | <LOD | 9.8 | <LOD | 311.8 | 19.1 | 206.2 | 26.4 | 423.6 | 61.4 | 117.9 | 42.4 | 6.6 | 1.1 | 5.4 | 3.6 | 2.0 | 2.2 | 0.5 |
| 28553 | 11.9 | 73.2 | 16.7 | 12.2 | <LOD | 310.4 | 20.1 | 218.3 | 28.0 | 395.3 | 62.7 | 109.2 | 39.8 | 5.0 | 0.8 | 3.6 | 4.3 | 2.4 | 2.7 | 0.3 |
| 35219 | 14.1 | 98.0 | <LOD | 12.8 | 8.1 | 275.6 | 22.8 | 225.3 | 24.9 | 361.4 | 53.6 | 115.3 | 36.2 | 7.3 | 0.7 | 5.6 | 4.5 | 2.9 | 2.5 | 0.3 |
| 37725 | 18.8 | 97.4 | <LOD | 14.9 | 6.9 | 261.8 | 23.7 | 207.7 | 23.8 | 319.9 | 53.2 | 98.5 | 44.1 | 7.2 | 1.1 | 6.6 | 5.7 | 3.2 | 2.3 | 0.4 |
| 45736 | 21.6 | 103.1 | 21.3 | 14.4 | 15.6 | 239.1 | 25.1 | 193.7 | 22.5 | 282.4 | 58.6 | 105.1 | 39.0 | 6.3 | 0.8 | 5.7 | 5.9 | 3.1 | 2.9 | 0.3 |
| 55395 | 26.4 | 120.9 | 41.5 | 19.0 | 7.8 | 254.5 | 25.5 | 202.7 | 20.8 | 266.3 | 48.9 | 109.6 | 40.6 | 8.3 | 1.4 | 6.2 | 5.3 | 3.2 | 2.8 | 0.4 |
| 58947 | 32.0 | 131.3 | 27.9 | 18.9 | 18.6 | 229.4 | 26.8 | 177.2 | 19.2 | 238.9 | 53.9 | 90.5 | 43.5 | 9.6 | 1.3 | 6.4 | 3.4 | 3.4 | 3.6 | 0.4 |
| 79547 | 34.7 | 158.1 | 31.2 | 23.7 | 18.5 | 219.7 | 28.7 | 159.0 | 16.9 | 208.5 | 43.5 | 96.0 | 50.3 | 9.5 | 1.5 | 7.0 | 7.6 | 2.3 | 2.9 | 0.6 |
| 89231 | 38.0 | 189.7 | 31.0 | 35.0 | 24.3 | 209.8 | 28.8 | 139.3 | 15.3 | 166.9 | 42.7 | 84.4 | 42.5 | 12.4 | 1.8 | 8.5 | 6.7 | 3.9 | 5.0 | 0.6 |
| 89952 | 42.0 | 195.4 | 53.1 | 27.8 | 29.5 | 186.5 | 32.3 | 147.7 | 11.6 | 133.7 | 37.8 | 80.8 | 54.9 | 9.5 | 2.0 | 7.6 | 6.3 | 3.6 | 2.7 | 0.5 |
| 110576 | 55.7 | 212.8 | 85.4 | 37.9 | 25.3 | 184.2 | 35.0 | 123.4 | 10.7 | 107.9 | 31.5 | 82.1 | 51.6 | 8.3 | 1.5 | 7.8 | 8.2 | 3.7 | 2.9 | 0.6 |
| 106560 | 56.6 | 196.1 | 100.4 | 36.4 | 38.5 | 171.8 | 31.5 | 118.5 | 7.5 | 83.4 | 28.4 | 72.4 | 53.1 | 12.8 | 2.0 | 8.0 | 6.3 | 3.4 | 2.0 | 0.4 |
| 122205 | 60.3 | 248.3 | 72.6 | 41.0 | 28.9 | 164.9 | 37.0 | 112.3 | 6.6 | 70.3 | 26.7 | 77.0 | 54.8 | 12.7 | 1.9 | 10.2 | 8.1 | 3.6 | 2.5 | 0.5 |
| 138271 | 70.5 | 247.6 | 71.6 | 46.6 | 31.2 | 178.4 | 39.5 | 99.0 | 5.6 | 53.8 | 26.2 | 68.5 | 42.8 | 11.8 | 2.0 | 9.6 | 7.0 | 2.9 | 2.4 | 0.4 |
| 150209 | 74.6 | 259.8 | 114.5 | 48.7 | 45.9 | 176.7 | 39.7 | 106.8 | 4.5 | 42.2 | 23.5 | 67.4 | 48.3 | 14.3 | 2.5 | 9.4 | 8.6 | 3.7 | 3.2 | 0.6 |
| 133178 | 62.4 | 220.3 | 67.3 | 35.6 | 37.6 | 142.3 | 35.2 | 91.5 | 3.6 | 29.0 | 21.4 | 64.1 | 51.3 | 11.2 | 1.9 | 11.3 | 7.6 | 3.1 | 2.9 | 0.5 |
| 145804 | 70.8 | 234.4 | 104.1 | 42.1 | 37.8 | 156.6 | 39.3 | 87.6 | 2.9 | 20.0 | 20.4 | 59.8 | 44.9 | 10.4 | 2.0 | 9.0 | 7.3 | 3.2 | 3.9 | 0.4 |
| 159846 | 73.4 | 218.5 | 137.3 | 45.7 | 38.5 | 159.3 | 29.3 | 77.2 | 1.8 | 16.4 | 19.5 | 58.9 | 44.2 | 10.9 | 1.7 | 9.0 | 10.1 | 4.5 | 4.0 | 0.6 |
| 162324 | 81.1 | 257.1 | 134.1 | 50.2 | 52.1 | 177.4 | 37.8 | 78.1 | 1.4 | 11.7 | 20.3 | 59.7 | 43.3 | 10.8 | 2.0 | 10.6 | 10.6 | 3.2 | 4.0 | 0.4 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 165881 | 82.2 | 214.3 | 224.2 | 53.4 | 41.0 | 160.1 | 35.9 | 76.2 | 0.9 | 8.9 | 19.3 | 56.4 | 43.2 | 10.0 | 1.6 | 10.6 | 6.8 | 3.5 | 3.9 | 0.5 |
| 166261 | 87.5 | 283.3 | 160.9 | 43.0 | 42.8 | 153.4 | 34.6 | 77.9 | 0.9 | 6.9 | 18.5 | 53.7 | 40.0 | 10.8 | 1.7 | 10.7 | 5.9 | 3.2 | 3.5 | 0.4 |
| 146127 | 84.9 | 223.1 | 180.4 | 53.9 | 60.0 | 163.3 | 33.7 | 74.0 | 0.6 | 5.4 | 14.6 | 49.9 | 40.7 | 13.6 | 1.5 | 6.9 | 4.8 | 3.5 | 2.7 | 0.6 |
| 141754 | 82.5 | 210.3 | 340.9 | 39.5 | 42.1 | 164.8 | 29.5 | 74.7 | 0.5 | 4.8 | 14.1 | 51.3 | 38.8 | 10.9 | 1.9 | 7.6 | 6.3 | 3.6 | 1.8 | 0.6 |
| 166156 | 111.6 | 214.3 | 681.0 | 42.4 | 44.4 | 164.5 | 34.1 | 66.7 | 0.5 | 5.2 | 15.6 | 53.0 | 43.5 | 7.9 | 2.2 | 11.8 | 7.0 | 2.1 | 2.5 | 0.4 |
| 148714 | 84.9 | 193.9 | 524.0 | 44.8 | 44.3 | 155.2 | 29.5 | 58.4 | 0.6 | 5.2 | 15.1 | 47.0 | 35.9 | 11.4 | 1.8 | 6.2 | 4.7 | 2.5 | 3.1 | 0.4 |
| 148567 | 94.7 | 218.5 | 1110.5 | 46.2 | 59.5 | 165.3 | 31.4 | 62.8 | 0.6 | 3.9 | 13.5 | 52.1 | 43.2 | 9.5 | 2.1 | 10.4 | 6.2 | 3.1 | 2.9 | 0.4 |
| 153903 | 94.1 | 207.8 | 734.1 | 38.5 | 52.7 | 146.6 | 27.3 | 55.7 | 0.3 | 3.9 | 11.9 | 41.5 | 32.1 | 10.4 | 1.7 | 7.0 | 4.4 | 2.4 | 2.0 | 0.3 |
| 147350 | 97.7 | 196.6 | 1209.4 | 42.2 | 88.7 | 152.1 | 26.7 | 64.9 | 0.6 | 3.8 | 14.7 | 40.5 | 35.5 | 6.6 | 1.5 | 8.1 | 5.2 | 2.6 | 2.9 | 0.5 |
| 163210 | 102.9 | 192.7 | 791.3 | 39.5 | 47.7 | 165.9 | 25.1 | 55.7 | 0.5 | 3.6 | 12.9 | 44.1 | 34.4 | 7.5 | 2.0 | 5.8 | 5.3 | 3.5 | 2.6 | 0.2 |
| 166204 | 104.2 | 204.3 | 2129.0 | 40.3 | 47.8 | 147.7 | 24.3 | 55.7 | 0.4 | 3.6 | 13.0 | 42.9 | 41.9 | 8.7 | 1.4 | 6.8 | 4.3 | 2.6 | 1.3 | 0.4 |
| 160219 | 104.6 | 192.6 | 1036.7 | 35.2 | 64.3 | 163.7 | 24.4 | 58.1 | 0.4 | 3.8 | 14.5 | 43.9 | 32.6 | 9.4 | 1.9 | 7.9 | 5.5 | 2.1 | 2.5 | 0.4 |
| 153750 | 100.1 | 182.9 | 853.2 | 40.4 | 63.0 | 146.8 | 26.7 | 49.8 | 0.4 | 3.5 | 14.5 | 43.1 | 30.7 | 9.7 | 1.3 | 7.5 | 5.4 | 2.2 | 1.3 | 0.2 |
| 150367 | 101.8 | 184.8 | 938.7 | 44.7 | 56.1 | 147.7 | 26.4 | 58.1 | 0.3 | 2.8 | 14.0 | 42.8 | 33.0 | 6.7 | 1.9 | 6.9 | 6.2 | 2.8 | 1.7 | 0.3 |
| 161997 | 96.5 | 167.6 | 1271.5 | 35.0 | 58.3 | 139.5 | 23.8 | 57.3 | 0.4 | 3.3 | 11.5 | 41.0 | 34.1 | 8.9 | 1.9 | 5.2 | 6.8 | 1.5 | 2.8 | 0.4 |
| 172900 | 107.8 | 130.9 | 1220.2 | 40.0 | 89.8 | 153.4 | 28.3 | 62.4 | 0.6 | 3.6 | 16.0 | 44.1 | 37.6 | 8.4 | 1.9 | 6.5 | 6.3 | 2.6 | 2.3 | 0.2 |
| 152350 | 92.5 | 184.3 | 1109.3 | 32.0 | 59.2 | 140.3 | 26.0 | 64.4 | 0.5 | 3.4 | 12.6 | 37.9 | 32.7 | 9.3 | 1.2 | 6.9 | 3.8 | 1.8 | 2.0 | 0.5 |
| 154681 | 109.2 | 175.3 | 2122.8 | 35.7 | 74.3 | 149.4 | 24.2 | 67.8 | 0.4 | 3.3 | 14.1 | 39.8 | 31.0 | 9.3 | 1.7 | 6.1 | 5.3 | 2.5 | 2.1 | 0.2 |
| 166855 | 116.6 | 201.7 | 1788.6 | 40.0 | 70.7 | 151.6 | 26.2 | 64.0 | 0.4 | 4.0 | 13.8 | 41.5 | 35.8 | 8.2 | 1.5 | 6.7 | 6.3 | 2.6 | 3.4 | 0.4 |
| 156299 | 102.8 | 208.8 | 3419.2 | 31.6 | 61.5 | 138.9 | 23.6 | 58.1 | 0.4 | 3.6 | 11.6 | 39.1 | 32.4 | 8.4 | 1.6 | 6.2 | 4.8 | 1.6 | 2.9 | 0.3 |
| 175220 | 112.5 | 207.9 | 1925.5 | 56.4 | 65.8 | 153.6 | 25.5 | 56.3 | 0.5 | 3.9 | 12.4 | 44.9 | 34.2 | 8.8 | 1.3 | 5.8 | 5.7 | 2.3 | 2.7 | 0.4 |
| 147765 | 116.3 | 161.2 | 2785.6 | 44.8 | 74.5 | 144.0 | 23.1 | 60.6 | 0.4 | 3.3 | 10.9 | 38.8 | 26.0 | 9.4 | 1.6 | 6.1 | 5.5 | 2.5 | 2.7 | 0.4 |
| 143319 | 121.7 | 204.0 | 2388.5 | 41.7 | 92.7 | 146.1 | 25.0 | 60.9 | 0.5 | 3.5 | 12.7 | 40.6 | 35.4 | 9.8 | 1.0 | 7.3 | 5.0 | 2.4 | 2.3 | 0.4 |
| 162052 | 114.1 | 200.6 | 1759.8 | 39.4 | 99.1 | 144.7 | 24.0 | 57.8 | 0.3 | 3.5 | 13.0 | 40.8 | 28.7 | 7.2 | 1.0 | 7.8 | 4.6 | 1.9 | 2.2 | 0.4 |
| 145199 | 115.2 | 181.1 | 1587.1 | 31.6 | 54.6 | 149.3 | 20.0 | 58.2 | 0.5 | 3.0 | 11.6 | 38.8 | 32.0 | 8.9 | 1.3 | 7.4 | 5.7 | 2.8 | 1.2 | 0.3 |
| 163334 | 112.3 | 186.4 | 2618.5 | 35.4 | 59.0 | 156.0 | 21.5 | 52.5 | 0.4 | 3.5 | 12.4 | 37.9 | 28.8 | 7.6 | 1.0 | 5.2 | 5.6 | 2.0 | 1.7 | 0.4 |
| 175144 | 130.5 | 167.8 | 2487.6 | 42.2 | 58.7 | 164.5 | 22.1 | 56.2 | 0.5 | 3.6 | 12.2 | 35.6 | 28.0 | 5.7 | 1.6 | 7.1 | 4.2 | 1.7 | 1.0 | 0.2 |
| 146461 | 115.9 | 163.0 | 2603.7 | 30.9 | 94.1 | 141.9 | 21.3 | 50.7 | 0.5 | 4.9 | 11.6 | 34.7 | 21.6 | 10.3 | 1.4 | 7.1 | 4.5 | 2.0 | 2.1 | 0.3 |
| 153515 | 103.3 | 162.7 | 2171.6 | 36.4 | 77.0 | 142.9 | 21.6 | 50.6 | 0.6 | 6.9 | 11.2 | 36.8 | 32.7 | 7.6 | 1.3 | 6.6 | 4.6 | 2.2 | 2.1 | 0.2 |
| 174883 | 106.7 | 160.6 | 2934.7 | 35.8 | 101.8 | 148.9 | 20.4 | 53.3 | 1.0 | 9.5 | 11.8 | 33.2 | 24.9 | 8.7 | 1.5 | 4.9 | 4.5 | 2.0 | 2.3 | 0.3 |
| 164627 | 115.9 | 185.0 | 2594.9 | 33.1 | 79.8 | 146.5 | 22.7 | 55.5 | 1.0 | 14.4 | 11.7 | 38.8 | 25.7 | 7.7 | 1.3 | 6.0 | 4.1 | 2.3 | 2.3 | 0.2 |
| 164255 | 122.0 | 164.6 | 3713.0 | 38.2 | 78.3 | 156.3 | 23.6 | 57.6 | 1.2 | 19.1 | 12.5 | 38.2 | 25.8 | 7.5 | 1.3 | 5.0 | 4.9 | 2.7 | 2.7 | 0.3 |
| 153581 | 108.5 | 139.3 | 2219.9 | 40.3 | 69.8 | 149.8 | 19.9 | 62.7 | 1.6 | 25.2 | 13.4 | 38.3 | 24.8 | 8.2 | 1.5 | 5.7 | 3.9 | 2.7 | 2.7 | 0.3 |
| 144333 | 105.9 | 161.3 | 2262.1 | 37.1 | 121.5 | 145.0 | 18.4 | 59.4 | 1.6 | 30.4 | 11.6 | 35.7 | 29.9 | 9.6 | 1.1 | 4.8 | 3.3 | 2.4 | 1.1 | 0.2 |
| 155099 | 119.5 | 151.5 | 2821.4 | 32.5 | 95.2 | 165.2 | 22.1 | 68.3 | 2.1 | 36.4 | 15.8 | 38.6 | 33.3 | 7.3 | 1.3 | 6.1 | 4.2 | 3.5 | 2.2 | 0.3 |
| 163090 | 124.1 | 163.4 | 2820.4 | 35.4 | 75.1 | 159.4 | 21.3 | 62.9 | 2.2 | 36.5 | 12.7 | 38.0 | 26.5 | 6.6 | 1.3 | 5.6 | 3.3 | 1.8 | 0.9 | 0.2 |
| 159771 | 132.3 | 154.1 | 2884.1 | 35.7 | 69.6 | 171.1 | 21.3 | 73.0 | 2.4 | 39.3 | 13.3 | 37.9 | 29.6 | 8.3 | 1.0 | 3.8 | 4.2 | 2.1 | 1.5 | 0.3 |
| 135420 | 123.6 | 119.8 | 2143.3 | 33.4 | 72.7 | 160.3 | 16.5 | 55.3 | 2.3 | 42.4 | 12.2 | 34.8 | 28.0 | 6.2 | 1.6 | 5.3 | 3.6 | 2.8 | 1.8 | 0.5 |
| 143324 | 110.5 | 174.0 | 2437.9 | 27.5 | 126.6 | 152.8 | 15.2 | 50.9 | 2.2 | 39.7 | 13.2 | 32.6 | 24.3 | 6.8 | 1.5 | 4.8 | 2.7 | 2.2 | 1.5 | 0.2 |
| 142138 | 117.0 | 134.8 | 2609.2 | 24.8 | 79.2 | 158.7 | 17.8 | 57.2 | 2.4 | 43.6 | 14.3 | 34.2 | 23.6 | 5.5 | 1.1 | 5.1 | 4.6 | 1.1 | 1.5 | 0.3 |
| 148235 | 109.7 | 121.3 | 2867.9 | 29.8 | 75.5 | 155.9 | 17.2 | 53.1 | 2.6 | 43.3 | 11.1 | 28.5 | 17.4 | 6.5 | 1.5 | 6.2 | 3.3 | 1.4 | 1.5 | <LOD |
| 166608 | 122.6 | 134.6 | 2498.3 | 31.2 | 82.9 | 166.3 | 16.9 | 55.1 | 3.0 | 47.4 | 12.4 | 35.5 | 26.2 | 7.3 | 1.6 | 4.7 | 3.4 | 2.0 | 1.2 | 0.2 |
| 137421 | 116.4 | 137.7 | 3104.3 | 33.4 | 97.4 | 159.9 | 15.7 | 58.3 | 2.8 | 43.6 | 13.2 | 31.3 | 26.2 | 6.5 | 1.1 | 3.3 | 3.3 | 1.6 | 0.9 | 0.2 |
| 153117 | 118.4 | 139.4 | 3256.5 | 30.8 | 78.0 | 158.9 | 15.4 | 66.7 | 2.8 | 44.6 | 12.3 | 33.9 | 27.7 | 5.9 | 1.2 | 5.1 | 2.7 | 0.8 | 1.3 | 0.1 |
| 142559 | 119.1 | 126.3 | 2606.0 | 29.9 | 80.3 | 151.5 | 13.3 | 49.9 | 2.2 | 39.9 | 12.2 | 28.8 | 26.0 | 5.6 | 1.4 | 6.1 | 3.5 | 1.1 | 2.0 | 0.4 |
| 122036 | 111.5 | 136.1 | 3204.2 | 25.7 | 79.0 | 157.0 | 13.7 | 50.9 | 2.1 | 37.2 | 11.6 | 29.0 | 20.0 | 5.1 | 1.2 | 5.3 | 2.0 | 1.8 | 1.3 | 0.2 |
| 140303 | 121.4 | 137.8 | 2319.3 | 28.0 | 104.5 | 159.3 | 14.5 | 42.1 | 1.8 | 30.1 | 9.5 | 27.4 | 18.0 | 6.0 | 1.1 | 3.8 | 2.0 | 2.0 | 1.1 | 0.4 |
| 153375 | 129.6 | 152.6 | 3531.0 | 30.3 | 110.8 | 166.9 | 16.9 | 56.0 | 1.8 | 27.0 | 10.6 | 29.0 | 20.2 | 6.7 | 1.3 | 5.3 | 3.3 | 1.9 | 1.8 | <LOD |
| 150372 | 109.9 | 124.9 | 2367.3 | 28.9 | 91.5 | 150.5 | 16.3 | 53.8 | 1.4 | 19.6 | 10.2 | 30.1 | 25.8 | 4.5 | 1.3 | 4.1 | 3.4 | 1.7 | 2.3 | 0.2 |
| 155199 | 105.4 | 134.1 | 4648.9 | 34.3 | 71.4 | 155.2 | 15.0 | 45.7 | 1.1 | 16.4 | 7.4 | 28.3 | 21.1 | 5.6 | 1.3 | 3.4 | 2.9 | 1.4 | 0.7 | 0.3 |
| 157758 | 135.8 | 135.2 | 3502.7 | 31.7 | 96.1 | 148.3 | 15.0 | 43.6 | 0.9 | 12.6 | 10.9 | 27.7 | 25.1 | 5.0 | 1.0 | 6.6 | 4.0 | 1.3 | 1.5 | 0.2 |
| 166202 | 135.1 | 143.4 | 2903.5 | 36.1 | 105.2 | 141.7 | 15.7 | 48.9 | 0.9 | 10.0 | 9.2 | 29.2 | 25.8 | 6.6 | 1.1 | 5.4 | 3.0 | 1.6 | 1.5 | 0.2 |
| 163688 | 154.6 | 167.0 | 2682.7 | 42.0 | 84.8 | 166.0 | 17.0 | 52.1 | 1.0 | 8.5 | 11.0 | 34.9 | 23.2 | 5.8 | 1.4 | 4.3 | 3.1 | 1.6 | 1.4 | 0.3 |
| 157837 | 123.8 | 159.3 | 1813.8 | 34.9 | 103.3 | 137.2 | 15.7 | 51.0 | 0.4 | 5.6 | 7.6 | 21.8 | 25.3 | 5.2 | 1.4 | 3.4 | 3.0 | 1.2 | <LOD | <LOD |
| 158717 | 122.1 | 183.7 | 2620.2 | 34.8 | 107.6 | 132.3 | 14.9 | 40.2 | 0.5 | 5.6 | 6.2 | 19.6 | 18.9 | 3.2 | 0.9 | 2.3 | 1.9 | 0.6 | 1.4 | <LOD |
| 184121 | 115.9 | 134.9 | 1821.6 | 33.3 | 77.6 | 131.0 | 13.3 | 40.3 | 0.4 | 5.0 | 5.0 | 22.3 | 9.8 | 1.7 | 0.5 | 4.0 | 1.9 | 0.6 | <LOD | <LOD |
| 157398 | 129.5 | 141.3 | 1966.2 | 28.6 | 56.6 | 147.9 | 14.6 | 37.5 | <LOD | 5.0 | 5.3 | 16.0 | 22.6 | 6.8 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD |
| 219781 | 106.7 | 160.5 | 2903.0 | 21.8 | 63.1 | 175.5 | 17.4 | 50.5 | 1.4 | 4.9 | 7.9 | 15.0 | 11.4 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD |
| 103100 | 124.9 | 207.6 | 3423.2 | 55.1 | | 134.6 | 15.4 | 31.5 | <LOD | 2.5 | 7.9 | 22.1 | 13.0 | 12.5 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD |
| 148426 | 140.9 | 204.5 | 2028.0 | 35.6 | | 99.4 | 12.9 | 51.1 | <LOD | <LOD | 4.0 | 13.2 | <LOD | <LOD | <LOD | <LOD | 11.5 | <LOD | <LOD | <LOD |
| GAT2.13.1track1 | | | | | | | | | | | | | | | | | | | | |
| 16462 | 6.6 | 65.6 | <LOD | 10.7 | <LOD | 326.3 | 19.6 | 215.0 | 26.6 | 443.1 | 57.2 | 109.3 | 34.6 | 7.7 | 1.5 | 4.9 | 3.5 | 1.5 | 1.9 | 0.4 |
| 15390 | 7.4 | 63.0 | <LOD | 8.2 | <LOD | 325.7 | 18.1 | 178.7 | 24.6 | 430.0 | 57.6 | 93.0 | 30.8 | 5.9 | 0.7 | 2.4 | 2.3 | 1.2 | 1.5 | 0.3 |
| 18524 | 7.7 | 78.7 | <LOD | 10.9 | <LOD | 350.9 | 19.3 | 195.6 | 28.3 | 473.7 | 57.0 | 111.8 | 27.8 | 6.1 | 0.9 | 4.1 | 3.4 | 2.2 | 1.5 | 0.6 |
| 24639 | 9.4 | 77.4 | <LOD | 11.2 | 5.5 | 395.7 | 20.6 | 209.2 | 28.3 | 464.7 | 67.6 | 118.9 | 41.7 | 10.0 | 1.6 | 5.7 | 4.6 | 2.4 | 2.5 | 0.4 |
| 35331 | 12.9 | 83.0 | <LOD | 14.2 | 7.2 | 316.0 | 23.2 | 179.2 | 23.8 | 402.9 | 59.0 | 108.0 | 39.7 | 7.1 | 1.6 | 5.0 | 5.6 | 2.6 | 1.9 | 0.5 |
| 48542 | 22.9 | 120.5 | <LOD | 19.5 | 16.5 | 308.8 | 24.7 | 179.3 | 22.7 | 358.9 | 61.1 | 110.2 | 49.8 | 8.8 | 1.5 | 9.2 | 5.4 | 2.4 | 1.4 | 0.4 |
| 57110 | 24.7 | 121.9 | <LOD | 19.2 | 13.8 | 274.7 | 30.0 | 178.0 | 19.7 | 319.9 | 51.9 | 103.2 | 45.5 | 11.0 | 1.0 | 6.2 | 5.6 | 3.6 | 3.8 | 0.7 |
| 80542 | 35.1 | 152.4 | <LOD | 27.1 | 24.9 | 278.0 | 32.8 | 179.9 | 16.6 | 259.2 | 54.0 | 106.5 | 49.7 | 12.0 | 1.9 | 7.5 | 6.1 | 3.9 | 4.6 | 0.5 |
| 88400 | 48.2 | 182.6 | 33.7 | 28.0 | 38.4 | 232.4 | 31.7 | 136.6 | 13.3 | 201.2 | 50.5 | 103.6 | 54.8 | 14.2 | 2.4 | 10.5 | 7.2 | 3.1 | 3.3 | 0.6 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98897 | 49.1 | 175.2 | <LOD | 31.5 | 26.7 | 218.3 | 33.3 | 133.6 | 10.5 | 150.9 | 37.8 | 92.4 | 53.9 | 11.6 | 1.9 | 7.8 | 5.7 | 3.6 | 2.0 | 0.2 |
| 97429 | 53.0 | 227.2 | 21.8 | 34.2 | 39.0 | 198.8 | 35.0 | 115.0 | 6.6 | 108.6 | 32.4 | 81.2 | 45.8 | 13.4 | 1.9 | 8.1 | 8.1 | 3.9 | 3.2 | 0.3 |
| 119291 | 65.1 | 217.2 | 25.7 | 35.5 | 25.1 | 181.8 | 34.4 | 109.8 | 4.8 | 78.0 | 30.1 | 80.8 | 48.6 | 9.6 | 2.3 | 9.0 | 8.4 | 5.0 | 3.4 | 0.5 |
| 130787 | 68.5 | 220.7 | 21.6 | 39.4 | 33.7 | 167.2 | 39.1 | 93.7 | 3.6 | 49.8 | 25.3 | 75.9 | 44.7 | 9.7 | 2.0 | 10.3 | 7.9 | 4.2 | 2.5 | 0.4 |
| 138725 | 79.1 | 243.6 | <LOD | 55.4 | 52.2 | 178.3 | 37.1 | 95.4 | 2.5 | 32.0 | 21.6 | 74.3 | 55.1 | 11.6 | 2.0 | 8.9 | 8.8 | 4.0 | 3.4 | 0.5 |
| 143316 | 87.2 | 217.9 | 24.4 | 39.8 | 52.1 | 165.7 | 37.9 | 78.8 | 1.3 | 19.1 | 20.4 | 61.0 | 48.7 | 12.7 | 2.2 | 10.3 | 9.5 | 4.2 | 4.2 | 0.5 |
| 169578 | 87.0 | 246.6 | 32.0 | 42.1 | 36.7 | 161.3 | 40.3 | 76.4 | 1.0 | 12.3 | 19.8 | 61.0 | 45.4 | 12.3 | 2.2 | 9.2 | 8.8 | 3.4 | 3.0 | 0.3 |
| 157305 | 88.8 | 288.4 | 50.9 | 49.5 | 46.5 | 173.3 | 40.6 | 74.6 | 0.8 | 9.7 | 20.3 | 61.0 | 44.5 | 10.3 | 1.9 | 11.1 | 7.5 | 3.4 | 3.9 | 0.8 |
| 154623 | 93.4 | 259.8 | 41.4 | 51.4 | 62.6 | 162.6 | 33.7 | 80.5 | 0.7 | 8.4 | 20.3 | 55.5 | 48.5 | 10.1 | 2.7 | 8.2 | 7.9 | 3.6 | 3.6 | 0.5 |
| 162119 | 96.9 | 248.3 | 68.0 | 50.4 | 37.7 | 159.7 | 35.9 | 82.4 | 0.7 | 6.3 | 16.3 | 57.1 | 47.3 | 12.3 | 1.6 | 10.6 | 7.7 | 2.7 | 2.7 | 0.3 |
| 145862 | 94.2 | 232.2 | 70.8 | 39.3 | 67.8 | 163.4 | 29.4 | 84.2 | 0.6 | 5.2 | 15.7 | 48.8 | 45.4 | 11.2 | 1.7 | 10.8 | 5.7 | 3.2 | 3.6 | 0.3 |
| 153850 | 90.2 | 240.9 | 68.8 | 45.5 | 39.0 | 162.0 | 33.2 | 78.0 | 0.4 | 5.0 | 13.8 | 48.5 | 44.9 | 11.4 | 2.3 | 8.6 | 7.5 | 2.7 | 2.7 | 0.4 |
| 165139 | 106.8 | 247.1 | 74.7 | 52.9 | 51.2 | 162.9 | 35.1 | 72.9 | 0.4 | 4.6 | 14.7 | 46.2 | 34.3 | 9.5 | 1.6 | 7.3 | 5.9 | 2.8 | 2.9 | 0.3 |
| 172285 | 102.8 | 217.2 | 112.0 | 50.0 | 48.7 | 177.2 | 31.9 | 75.2 | 0.6 | 4.5 | 14.3 | 41.0 | 32.8 | 12.3 | 2.5 | 9.5 | 5.7 | 2.8 | 2.0 | 0.4 |
| 164682 | 113.3 | 198.8 | 50.2 | 41.2 | 49.5 | 160.9 | 31.2 | 77.5 | 0.5 | 4.6 | 11.8 | 46.3 | 39.2 | 7.5 | 1.7 | 7.8 | 5.6 | 3.0 | 1.5 | 0.5 |
| 171607 | 107.2 | 229.5 | 89.3 | 49.6 | 46.5 | 170.9 | 29.0 | 76.0 | 0.5 | 3.5 | 10.9 | 41.1 | 29.9 | 6.8 | 1.6 | 6.0 | 5.6 | 3.3 | 2.2 | 0.4 |
| 159704 | 97.5 | 187.0 | 123.4 | 38.9 | 29.1 | 152.5 | 24.4 | 69.1 | 0.4 | 2.9 | 12.1 | 36.8 | 36.1 | 6.8 | 1.7 | 6.0 | 5.2 | 3.6 | 1.7 | 0.3 |
| 176452 | 93.1 | 202.6 | 109.7 | 42.6 | 65.9 | 165.6 | 27.8 | 68.1 | 0.5 | 4.1 | 11.4 | 39.0 | 30.1 | 9.4 | 1.6 | 7.6 | 6.8 | 2.3 | 1.9 | 0.4 |
| 178774 | 110.8 | 178.9 | 166.9 | 46.1 | 53.0 | 164.2 | 27.7 | 67.9 | 0.5 | 4.2 | 11.9 | 36.0 | 26.0 | 8.7 | 2.0 | 5.9 | 6.3 | 2.6 | 1.7 | 0.3 |
| 157948 | 113.7 | 224.7 | 116.7 | 48.5 | 64.7 | 158.6 | 20.8 | 60.8 | 0.5 | 3.3 | 12.4 | 34.9 | 24.9 | 8.2 | 1.3 | 7.2 | 4.7 | 2.6 | 2.2 | 0.5 |
| 145573 | 102.1 | 185.1 | 106.1 | 49.2 | 74.0 | 154.5 | 23.1 | 61.3 | 0.4 | 3.0 | 9.7 | 34.1 | 31.4 | 6.9 | 1.2 | 4.9 | 5.1 | 2.8 | 2.6 | 0.1 |
| 147491 | 106.1 | 161.3 | 193.9 | 46.9 | 54.6 | 164.3 | 18.9 | 68.5 | 0.3 | 3.4 | 8.3 | 32.8 | 26.5 | 5.4 | 1.4 | 4.7 | 4.1 | 2.5 | 1.8 | 0.3 |
| 173035 | 135.5 | 184.6 | 461.3 | 44.1 | 55.7 | 172.1 | 23.4 | 65.7 | 0.7 | 3.4 | 9.9 | 32.4 | 30.8 | 5.7 | 1.6 | 5.1 | 4.2 | 2.6 | 2.3 | 0.3 |
| 155566 | 108.6 | 143.4 | 286.1 | 40.5 | 57.9 | 152.5 | 19.2 | 52.3 | 0.4 | 3.1 | 7.6 | 29.2 | 23.1 | 4.6 | 1.4 | 5.2 | 3.6 | 1.8 | 1.8 | 0.3 |
| 163362 | 110.9 | 182.2 | 435.3 | 45.0 | 73.9 | 158.0 | 22.1 | 51.3 | 0.5 | 2.7 | 8.5 | 32.0 | 22.8 | 6.9 | 1.7 | 6.9 | 3.2 | 1.6 | 1.3 | 0.2 |
| 163992 | 120.2 | 190.5 | 273.0 | 38.0 | 74.5 | 157.6 | 17.0 | 53.7 | 0.3 | 2.5 | 8.9 | 26.3 | 20.8 | 5.8 | 1.0 | 4.4 | 3.3 | 1.8 | 2.2 | 0.2 |
| 141259 | 117.0 | 148.9 | 419.0 | 40.1 | 98.2 | 145.1 | 17.2 | 59.8 | 0.2 | 2.3 | 9.3 | 23.7 | 24.8 | 3.2 | 1.5 | 4.5 | 3.5 | 1.8 | 2.1 | 0.2 |
| 149005 | 120.0 | 147.0 | 262.8 | 35.9 | 56.7 | 153.9 | 16.1 | 45.6 | 0.3 | 2.1 | 7.8 | 24.5 | 19.3 | 3.5 | 0.9 | 2.8 | 3.5 | 1.4 | 1.8 | 0.2 |
| 185516 | 115.8 | 180.2 | 812.9 | 45.2 | 65.4 | 156.7 | 15.9 | 50.8 | 0.5 | 2.1 | 8.4 | 26.2 | 23.0 | 5.9 | 1.2 | 5.4 | 3.8 | 1.9 | 0.7 | 0.3 |
| 175881 | 127.1 | 167.5 | 454.0 | 44.5 | 69.4 | 173.0 | 15.2 | 44.9 | 0.4 | 2.6 | 8.0 | 25.4 | 17.1 | 5.9 | 1.0 | 5.0 | 3.5 | 1.7 | 0.5 | 0.1 |
| 168558 | 120.3 | 159.4 | 292.4 | 44.0 | 85.1 | 145.7 | 15.7 | 46.2 | 0.4 | 2.1 | 7.9 | 22.6 | 17.8 | 6.8 | 1.4 | 4.3 | 2.9 | 1.7 | 1.1 | 0.2 |
| 143036 | 119.9 | 140.7 | 379.9 | 37.0 | 58.5 | 147.5 | 13.7 | 45.5 | 0.3 | 2.0 | 7.9 | 22.3 | 18.6 | 4.5 | 1.1 | 3.0 | 3.1 | 1.3 | 1.1 | 0.2 |
| 159598 | 113.6 | 127.3 | 506.2 | 32.5 | 73.3 | 145.8 | 14.0 | 39.7 | 0.2 | 2.2 | 7.0 | 21.0 | 23.6 | 5.9 | 1.0 | 4.8 | 2.9 | 0.7 | 0.9 | 0.1 |
| 181722 | 137.4 | 111.9 | 466.8 | 35.1 | 79.6 | 166.1 | 13.9 | 42.7 | 0.4 | 2.1 | 7.6 | 22.8 | 19.2 | 3.7 | 1.3 | 4.3 | 4.0 | 1.0 | 0.7 | <LOD |
| 150513 | 119.0 | 143.6 | 435.5 | 34.5 | 87.3 | 140.7 | 13.2 | 45.1 | 0.3 | 2.0 | 6.7 | 19.7 | 17.2 | 4.6 | 0.8 | 3.8 | 2.6 | 2.7 | 1.1 | 0.3 |
| 151602 | 117.3 | 129.3 | 785.4 | 40.1 | 72.1 | 154.7 | 11.8 | 45.5 | 0.3 | 1.6 | 6.2 | 18.1 | 14.6 | 4.2 | 1.2 | 4.1 | 2.5 | 2.2 | 1.1 | 0.2 |
| 168597 | 130.9 | 152.6 | 780.6 | 39.0 | 77.9 | 148.0 | 13.0 | 44.4 | 0.2 | 1.9 | 7.3 | 19.6 | 20.9 | 4.5 | 1.1 | 3.0 | 3.7 | 1.3 | 1.0 | 0.2 |
| 151406 | 126.1 | 164.2 | 1434.2 | 35.9 | 74.9 | 142.0 | 13.4 | 41.8 | 0.2 | 1.9 | 5.9 | 18.6 | 17.7 | 4.1 | 0.8 | 5.1 | 3.3 | 1.9 | 0.9 | 0.2 |
| 165422 | 114.3 | 158.3 | 786.7 | 42.7 | 68.1 | 149.0 | 11.3 | 38.7 | 0.3 | 6.4 | 5.9 | 22.6 | 16.1 | 3.9 | 1.2 | 2.8 | 2.1 | 1.2 | 0.6 | 0.2 |
| 159665 | 133.4 | 141.0 | 1409.7 | 39.0 | 110.6 | 155.2 | 14.2 | 44.5 | 0.2 | 1.5 | 7.1 | 20.9 | 15.3 | 3.9 | 0.8 | 1.5 | 2.1 | 1.0 | 1.2 | <LOD |
| 160132 | 143.6 | 157.2 | 993.0 | 41.3 | 105.3 | 151.4 | 12.6 | 44.6 | 0.2 | 1.6 | 5.7 | 21.3 | 18.5 | 5.4 | 0.8 | 3.0 | 3.0 | 1.7 | 1.0 | <LOD |
| 162575 | 133.2 | 151.3 | 677.8 | 36.0 | 103.9 | 141.9 | 13.0 | 41.6 | 0.2 | 1.4 | 6.5 | 18.8 | 17.4 | 5.4 | 1.4 | 4.6 | 2.0 | 1.4 | 0.9 | 0.2 |
| 152921 | 141.1 | 147.8 | 673.9 | 31.9 | 77.5 | 146.2 | 11.3 | 51.4 | 0.2 | 1.2 | 6.4 | 18.5 | 15.2 | 3.5 | 1.2 | 3.8 | 3.0 | 1.4 | 1.2 | <LOD |
| 158503 | 131.5 | 151.4 | 1012.5 | 37.4 | 69.8 | 152.9 | 11.5 | 44.6 | 0.2 | 1.2 | 5.4 | 19.1 | 16.3 | 3.8 | 1.1 | 3.0 | 3.1 | 1.2 | 1.6 | 0.1 |
| 174235 | 143.7 | 144.8 | 832.7 | 39.6 | 74.3 | 155.2 | 13.0 | 45.3 | 0.2 | 1.1 | 5.7 | 16.8 | 15.5 | 6.2 | 1.3 | 2.8 | 1.5 | 0.8 | 1.2 | 0.2 |
| 158628 | 133.7 | 136.7 | 1016.0 | 29.7 | 73.3 | 140.7 | 11.2 | 37.9 | 0.2 | 1.0 | 6.6 | 18.5 | 16.5 | 6.5 | 1.1 | 4.0 | 2.9 | 1.2 | 1.0 | 0.1 |
| 154492 | 124.5 | 144.9 | 824.0 | 42.3 | 63.8 | 149.1 | 11.5 | 41.6 | 0.2 | 0.9 | 5.7 | 18.8 | 20.1 | 4.5 | 1.1 | 4.2 | 3.6 | 1.4 | 0.4 | 0.1 |
| 180659 | 139.3 | 159.9 | 1125.3 | 43.3 | 93.5 | 146.0 | 11.8 | 46.0 | 0.3 | 0.8 | 6.5 | 19.3 | 18.3 | 4.1 | 1.1 | 3.5 | 3.1 | 1.6 | 1.2 | 0.2 |
| 176383 | 129.5 | 146.4 | 971.4 | 37.1 | 78.7 | 151.7 | 13.2 | 42.9 | 0.3 | 0.8 | 5.7 | 22.3 | 16.9 | 4.4 | 0.7 | 3.6 | 3.0 | 1.6 | 1.6 | 0.1 |
| 167232 | 142.0 | 144.7 | 1305.2 | 44.9 | 73.1 | 155.9 | 14.2 | 46.3 | 0.1 | 0.9 | 5.8 | 18.4 | 13.3 | 4.9 | 1.3 | 4.4 | 3.0 | 1.2 | 0.5 | 0.1 |
| 165585 | 132.3 | 124.0 | 960.3 | 38.2 | 86.6 | 147.7 | 11.5 | 48.2 | 0.2 | 1.0 | 6.4 | 22.3 | 16.8 | 4.4 | 1.3 | 4.7 | 3.7 | 1.0 | <LOD | 0.1 |
| 164072 | 125.0 | 144.5 | 867.6 | 39.5 | 102.8 | 140.8 | 11.2 | 42.8 | 0.1 | 1.6 | 6.6 | 19.6 | 16.4 | 4.7 | 0.6 | 3.9 | 3.3 | 0.8 | 0.6 | <LOD |
| 151287 | 137.4 | 140.1 | 1066.7 | 36.0 | 85.9 | 159.8 | 13.4 | 49.1 | 0.2 | 2.3 | 6.4 | 21.2 | 19.0 | 3.4 | 1.1 | 3.5 | 3.8 | 1.5 | 0.7 | 0.2 |
| 163216 | 138.4 | 141.4 | 1096.8 | 36.0 | 85.8 | 144.2 | 11.7 | 47.7 | 0.2 | 2.5 | 5.7 | 19.5 | 15.0 | 5.7 | 1.0 | 4.6 | 3.5 | 0.9 | 1.5 | 0.1 |
| 181148 | 144.4 | 136.9 | 1121.2 | 42.1 | 75.6 | 148.5 | 14.2 | 46.5 | 0.5 | 3.1 | 6.9 | 20.5 | 18.8 | 4.7 | 1.1 | 3.5 | 4.3 | 1.2 | 0.9 | 0.2 |
| 163295 | 144.4 | 125.9 | 782.6 | 42.4 | 86.3 | 152.5 | 13.1 | 43.5 | 0.4 | 3.2 | 6.0 | 20.4 | 18.9 | 5.4 | 1.0 | 3.0 | 3.0 | 2.3 | 1.7 | 0.3 |
| 158763 | 139.5 | 166.9 | 913.3 | 32.8 | 130.1 | 147.3 | 14.3 | 39.9 | 0.5 | 3.8 | 5.9 | 21.7 | 17.8 | 5.3 | 0.8 | 2.8 | 2.6 | 1.7 | 0.8 | 0.1 |
| 169929 | 134.8 | 141.8 | 940.5 | 35.5 | 71.8 | 149.7 | 13.4 | 41.6 | 0.5 | 4.8 | 6.5 | 15.7 | 13.2 | 2.7 | 1.1 | 2.9 | 2.7 | 0.9 | 0.6 | <LOD |
| 170424 | 133.7 | 129.2 | 984.3 | 34.6 | 75.2 | 145.9 | 12.6 | 39.5 | 0.5 | 4.9 | 5.9 | 13.0 | 12.5 | 3.0 | 0.3 | 2.0 | 2.6 | 0.6 | <LOD | <LOD |
| 177483 | 129.0 | 130.4 | 731.5 | 29.3 | 69.7 | 142.0 | 12.4 | 40.3 | 0.7 | 4.9 | 3.3 | 14.2 | 10.8 | 1.9 | 0.6 | <LOD | 0.8 | <LOD | 1.2 | <LOD |
| GAT2.13.1track2 | | | | | | | | | | | | | | | | | | | | |
| 84903 | 38.3 | 165.9 | <LOD | 31.1 | 16.0 | 287.7 | 30.9 | 153.0 | 13.6 | 282.6 | 38.9 | 85.0 | 50.8 | 10.0 | 1.8 | 10.1 | 5.3 | 3.5 | 2.9 | 0.4 |
| 89744 | 44.8 | 178.9 | <LOD | 31.1 | 18.1 | 243.6 | 31.2 | 110.5 | 8.9 | 202.7 | 31.0 | 67.7 | 41.6 | 9.4 | 2.0 | 7.3 | 5.0 | 3.4 | 3.2 | 0.4 |
| 102791 | 56.7 | 251.7 | 29.5 | 36.4 | 22.3 | 235.0 | 33.2 | 115.0 | 6.6 | 151.4 | 25.8 | 70.7 | 33.8 | 10.5 | 1.4 | 9.1 | 6.8 | 2.8 | 5.1 | 0.5 |
| 124310 | 64.7 | 221.0 | 22.9 | 37.7 | 27.2 | 205.1 | 37.4 | 97.9 | 5.0 | 98.2 | 24.8 | 66.4 | 39.3 | 14.6 | 1.6 | 9.3 | 5.9 | 5.4 | 3.1 | 0.3 |
| 148420 | 71.6 | 214.8 | 19.1 | 43.2 | 35.7 | 166.3 | 36.1 | 85.5 | 2.9 | 57.6 | 22.7 | 60.8 | 41.8 | 11.5 | 1.9 | 10.2 | 7.0 | 5.0 | 3.5 | 0.6 |
| 149377 | 73.6 | 293.9 | 25.5 | 50.7 | 50.2 | 166.4 | 35.3 | 80.3 | 1.9 | 35.8 | 21.8 | 62.3 | 43.8 | 12.5 | 1.7 | 10.6 | 6.9 | 3.7 | 3.4 | 0.4 |
| 143845 | 70.3 | 226.2 | 24.7 | 47.3 | 33.4 | 156.2 | 35.3 | 84.3 | 1.4 | 26.9 | 19.2 | 62.3 | 45.0 | 11.9 | 2.3 | 9.2 | 8.2 | 3.8 | 4.1 | 0.6 |
| 141661 | 76.9 | 258.3 | 53.1 | 37.6 | 49.4 | 144.9 | 36.1 | 85.4 | 0.9 | 13.4 | 19.5 | 57.9 | 44.9 | 11.9 | 1.5 | 10.3 | 8.2 | 4.6 | 2.9 | 0.6 |
| 145530 | 77.5 | 266.0 | 59.8 | 43.1 | 53.4 | 140.1 | 33.6 | 76.4 | 0.7 | 11.0 | 21.1 | 65.8 | 39.5 | 11.8 | 1.9 | 9.8 | 8.4 | 3.1 | 3.7 | 0.4 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 164193 | 86.0 | 230.5 | 26.0 | 44.5 | 51.4 | 154.0 | 35.7 | 82.3 | 0.4 | 7.8 | 21.2 | 66.8 | 45.6 | 11.5 | 2.0 | 10.2 | 8.3 | 5.7 | 2.9 | 0.5 |
| 158390 | 78.6 | 272.3 | 37.8 | 50.7 | 57.1 | 152.0 | 37.0 | 79.5 | 0.6 | 6.1 | 18.3 | 59.9 | 44.2 | 10.7 | 2.1 | 11.2 | 8.9 | 3.9 | 3.5 | 0.7 |
| 142805 | 77.8 | 252.2 | 38.8 | 44.9 | 40.3 | 140.3 | 38.3 | 76.0 | 0.6 | 5.0 | 18.9 | 61.1 | 46.8 | 11.5 | 1.7 | 9.5 | 7.4 | 4.2 | 5.0 | 0.6 |
| 134642 | 77.7 | 227.7 | 23.6 | 51.1 | 38.8 | 135.4 | 39.2 | 83.6 | 0.4 | 3.9 | 20.8 | 61.4 | 42.3 | 10.7 | 2.2 | 10.5 | 8.6 | 4.3 | 4.2 | 0.6 |
| 143693 | 83.7 | 256.2 | 27.5 | 54.1 | 51.3 | 151.5 | 36.7 | 79.9 | 0.4 | 4.2 | 18.6 | 64.7 | 50.6 | 13.1 | 2.2 | 8.2 | 6.9 | 4.2 | 2.7 | 0.7 |
| 152337 | 89.9 | 242.0 | 43.0 | 42.6 | 39.9 | 145.8 | 44.2 | 78.0 | 0.3 | 2.6 | 20.9 | 57.3 | 48.5 | 10.9 | 2.3 | 14.0 | 7.9 | 4.5 | 3.6 | 0.3 |
| 165376 | 80.2 | 270.2 | 37.2 | 41.3 | 34.7 | 141.0 | 39.5 | 69.1 | 0.4 | 3.6 | 18.8 | 63.7 | 46.5 | 9.5 | 2.1 | 10.6 | 9.1 | 4.2 | 2.4 | 0.5 |
| 162724 | 83.9 | 322.3 | 31.2 | 49.0 | 58.5 | 163.5 | 44.9 | 77.9 | 0.5 | 2.8 | 22.1 | 64.9 | 47.6 | 19.1 | 1.7 | 12.7 | 7.4 | 4.7 | 4.6 | 0.7 |
| 145568 | 80.1 | 273.2 | 21.7 | 52.5 | 56.1 | 140.3 | 35.9 | 77.3 | 0.4 | 2.8 | 19.3 | 58.5 | 52.0 | 11.7 | 2.2 | 9.8 | 8.1 | 3.7 | 3.4 | 0.5 |
| 157909 | 83.1 | 255.5 | 49.0 | 55.0 | 36.2 | 137.5 | 36.7 | 70.7 | 0.4 | 3.0 | 18.6 | 62.9 | 46.4 | 9.2 | 2.6 | 9.8 | 6.5 | 3.5 | 3.5 | 0.5 |
| 148897 | 83.6 | 251.5 | 68.0 | 44.7 | 73.0 | 145.5 | 34.2 | 78.1 | 0.5 | 3.2 | 16.9 | 60.7 | 46.9 | 11.6 | 2.3 | 10.8 | 7.9 | 3.5 | 2.0 | 0.5 |
| 157652 | 81.8 | 280.8 | 43.4 | 47.2 | 44.7 | 136.2 | 40.3 | 72.5 | 0.3 | 2.7 | 15.5 | 56.4 | 55.5 | 9.5 | 2.0 | 10.4 | 6.7 | 3.4 | 2.3 | 0.4 |
| 179760 | 96.2 | 255.7 | 58.9 | 49.6 | 53.3 | 153.8 | 34.9 | 74.9 | 0.4 | 2.5 | 16.5 | 53.4 | 43.0 | 11.6 | 1.3 | 9.2 | 7.9 | 2.7 | 1.5 | 0.4 |
| 162344 | 96.4 | 233.7 | 109.4 | 51.7 | 45.7 | 161.2 | 29.5 | 67.9 | 0.3 | 2.9 | 15.5 | 44.4 | 31.2 | 8.9 | 1.4 | 8.0 | 7.6 | 3.6 | 2.5 | 0.3 |
| 161957 | 94.2 | 206.2 | 85.4 | 38.9 | 46.9 | 132.3 | 28.9 | 62.0 | 0.7 | 2.1 | 13.2 | 43.9 | 40.7 | 6.8 | 1.3 | 5.9 | 6.8 | 3.8 | 1.9 | 0.5 |
| 158153 | 92.0 | 217.9 | 138.2 | 45.6 | 48.9 | 152.3 | 25.5 | 69.4 | 0.3 | 1.5 | 10.7 | 37.6 | 32.6 | 6.3 | 1.2 | 7.3 | 4.6 | 2.7 | 1.3 | 0.3 |
| 172218 | 94.3 | 190.7 | 183.9 | 42.2 | 40.1 | 149.1 | 22.4 | 50.1 | 0.3 | 1.8 | 12.2 | 38.0 | 27.2 | 7.9 | 1.6 | 5.8 | 4.8 | 2.6 | 1.6 | 0.3 |
| 157775 | 95.4 | 181.5 | 191.5 | 49.9 | 83.3 | 157.6 | 21.2 | 49.5 | 0.3 | 2.1 | 9.5 | 33.9 | 24.0 | 6.6 | 1.6 | 5.8 | 3.7 | 3.0 | 1.9 | 0.4 |
| 184423 | 101.3 | 149.3 | 382.7 | 46.2 | 53.3 | 147.0 | 23.7 | 47.0 | 0.2 | 3.6 | 10.6 | 33.1 | 24.9 | 5.1 | 1.2 | 6.0 | 4.8 | 2.2 | 2.5 | 0.2 |
| 173788 | 112.8 | 204.0 | 212.7 | 45.5 | 53.1 | 156.6 | 21.4 | 46.0 | 0.2 | 1.8 | 9.6 | 34.0 | 26.6 | 6.4 | 1.1 | 5.9 | 4.3 | 2.0 | 2.5 | 0.1 |
| 153988 | 106.7 | 169.4 | 238.9 | 49.1 | 59.1 | 148.1 | 18.7 | 45.3 | 0.3 | 1.6 | 9.3 | 30.7 | 26.2 | 5.0 | 1.1 | 4.6 | 4.6 | 2.1 | 1.9 | 0.1 |
| 139546 | 108.7 | 152.8 | 388.4 | 44.2 | 48.5 | 154.8 | 20.5 | 54.4 | 0.3 | 1.6 | 9.4 | 35.4 | 26.0 | 5.3 | 1.1 | 6.2 | 3.9 | 1.9 | 2.5 | 0.5 |
| 167756 | 136.8 | 170.9 | 914.3 | 44.8 | 52.7 | 157.2 | 23.1 | 50.4 | 0.2 | 1.7 | 8.5 | 29.6 | 27.5 | 8.4 | 1.4 | 4.9 | 4.3 | 1.4 | 1.8 | 0.3 |
| 147402 | 97.6 | 136.0 | 499.2 | 40.6 | 39.2 | 134.8 | 17.9 | 42.7 | 0.1 | 8.5 | 8.1 | 26.4 | 20.1 | 5.3 | 1.2 | 4.1 | 3.8 | 2.1 | 0.5 | 0.4 |
| 173798 | 123.1 | 194.4 | 1130.2 | 50.3 | 68.5 | 159.4 | 25.1 | 52.3 | 0.2 | 1.5 | 9.1 | 33.9 | 28.4 | 7.5 | 1.5 | 7.0 | 3.1 | 1.7 | 2.4 | 0.2 |
| 166130 | 119.7 | 194.0 | 565.2 | 40.3 | 70.0 | 149.4 | 18.7 | 49.4 | 0.2 | 1.3 | 8.8 | 26.9 | 23.2 | 8.2 | 1.6 | 6.1 | 4.3 | 2.9 | 1.4 | 0.3 |
| 137754 | 114.5 | 161.1 | 856.8 | 38.7 | 77.9 | 142.0 | 19.9 | 56.1 | 0.1 | 1.3 | 9.0 | 27.6 | 25.8 | 5.8 | 1.4 | 6.6 | 4.5 | 1.4 | 1.9 | 0.3 |
| 148087 | 126.2 | 165.0 | 534.2 | 38.5 | 61.5 | 147.1 | 19.6 | 44.8 | 0.2 | 1.6 | 9.5 | 31.9 | 23.6 | 6.0 | 1.0 | 3.9 | 4.0 | 1.9 | 1.7 | 0.1 |
| 187118 | 119.9 | 183.3 | 1449.6 | 47.5 | 41.5 | 153.5 | 20.9 | 47.9 | 0.2 | 1.5 | 8.1 | 34.3 | 28.8 | 7.5 | 1.3 | 6.4 | 4.1 | 2.5 | 1.9 | 0.4 |
| 165021 | 126.2 | 178.2 | 670.0 | 35.4 | 77.7 | 161.6 | 20.0 | 47.2 | 0.3 | 1.8 | 9.7 | 34.3 | 26.5 | 8.1 | 1.7 | 5.9 | 4.4 | 1.6 | 0.9 | 0.4 |
| 167313 | 122.2 | 157.5 | 509.3 | 42.4 | 72.2 | 147.4 | 20.5 | 48.8 | 0.3 | 1.6 | 14.0 | 31.3 | 22.6 | 6.3 | 1.3 | 5.9 | 5.1 | 2.0 | 1.5 | 0.1 |
| 138297 | 118.3 | 159.2 | 486.5 | 43.5 | 55.2 | 138.3 | 17.4 | 49.4 | 0.2 | 1.5 | 9.2 | 29.0 | 23.5 | 7.7 | 1.4 | 5.5 | 4.0 | 2.2 | 2.0 | 0.3 |
| 160583 | 105.5 | 139.4 | 678.0 | 31.8 | 70.8 | 128.8 | 20.4 | 43.6 | 0.3 | 1.2 | 8.2 | 28.1 | 22.8 | 7.5 | 1.5 | 3.7 | 4.2 | 1.9 | 1.3 | 0.3 |
| 167212 | 118.6 | 118.1 | 581.0 | 36.2 | 64.2 | 149.6 | 20.5 | 46.7 | 0.3 | 1.3 | 11.9 | 29.9 | 24.6 | 7.0 | 1.1 | 6.0 | 5.7 | 1.8 | 2.2 | 0.4 |
| 150026 | 106.6 | 173.7 | 513.0 | 31.3 | 73.5 | 140.4 | 19.6 | 51.6 | 0.3 | 1.2 | 10.1 | 27.9 | 27.6 | 8.6 | 1.0 | 6.3 | 4.1 | 1.6 | 1.2 | 0.2 |
| 151148 | 111.4 | 159.2 | 769.2 | 37.6 | 81.4 | 156.2 | 19.2 | 57.6 | 0.3 | 1.2 | 9.3 | 32.3 | 26.6 | 7.6 | 1.0 | 5.2 | 4.0 | 1.7 | 2.3 | 0.1 |
| 160607 | 126.2 | 186.0 | 636.0 | 40.3 | 92.1 | 146.9 | 23.0 | 51.8 | 0.2 | 1.2 | 11.4 | 32.3 | 29.6 | 7.3 | 1.4 | 5.7 | 6.2 | 1.9 | 1.4 | 0.2 |
| 149393 | 110.0 | 206.6 | 957.0 | 40.4 | 71.4 | 142.9 | 19.9 | 54.6 | 0.3 | 1.0 | 9.0 | 31.5 | 28.8 | 4.8 | 1.6 | 6.6 | 3.1 | 2.4 | 1.2 | 0.3 |
| 163036 | 106.8 | 189.1 | 492.9 | 44.9 | 82.9 | 154.9 | 19.5 | 51.4 | 0.3 | 1.3 | 9.4 | 36.0 | 25.5 | 6.3 | 1.5 | 6.3 | 4.7 | 1.4 | 3.0 | 0.3 |
| 139448 | 120.3 | 156.0 | 782.4 | 46.4 | 69.5 | 145.1 | 20.2 | 55.1 | 0.2 | 1.2 | 10.4 | 32.1 | 30.9 | 6.5 | 1.2 | 5.4 | 3.4 | 2.5 | 3.0 | 0.2 |
| 152143 | 119.9 | 201.9 | 608.2 | 41.8 | 76.2 | 146.7 | 19.3 | 52.7 | 0.3 | 1.5 | 11.5 | 33.6 | 31.1 | 7.5 | 1.5 | 4.9 | 4.1 | 2.2 | 2.4 | 0.2 |
| 156298 | 116.2 | 200.7 | 401.3 | 39.2 | 106.1 | 141.8 | 22.2 | 57.2 | 0.3 | 1.3 | 9.0 | 32.6 | 29.7 | 7.8 | 1.5 | 5.0 | 5.1 | 2.8 | 1.4 | 0.2 |
| 155398 | 129.5 | 178.8 | 414.0 | 38.6 | 66.4 | 152.0 | 21.0 | 56.2 | 0.4 | 1.6 | 9.9 | 31.6 | 26.5 | 9.7 | 1.6 | 5.9 | 5.4 | 1.4 | 2.2 | 0.3 |
| 159920 | 135.7 | 203.5 | 731.7 | 38.7 | 76.9 | 160.1 | 18.1 | 54.6 | 0.3 | 1.1 | 10.0 | 32.9 | 25.7 | 7.1 | 1.6 | 5.6 | 5.0 | 1.8 | 1.7 | 0.2 |
| 174962 | 129.1 | 175.5 | 702.5 | 43.2 | 75.6 | 161.0 | 21.9 | 59.9 | 0.3 | 1.1 | 9.4 | 29.0 | 22.8 | 6.8 | 1.4 | 5.0 | 4.6 | 1.6 | 2.8 | 0.3 |
| 153509 | 133.9 | 158.2 | 675.1 | 30.9 | 94.5 | 138.4 | 17.5 | 49.2 | 0.3 | 1.2 | 9.5 | 28.7 | 20.8 | 8.0 | 1.0 | 6.8 | 4.5 | 1.7 | 2.0 | 0.2 |
| 155840 | 121.8 | 160.4 | 588.6 | 41.0 | 69.7 | 142.7 | 16.6 | 51.2 | 0.3 | 1.2 | 7.8 | 24.7 | 23.2 | 5.7 | 1.5 | 6.9 | 3.0 | 1.5 | 1.1 | 0.3 |
| 177666 | 133.4 | 161.9 | 763.1 | 36.1 | 109.5 | 142.1 | 17.9 | 50.3 | 0.2 | 1.3 | 8.3 | 22.1 | 20.0 | 5.2 | 1.3 | 6.4 | 3.4 | 1.7 | 1.7 | 0.3 |
| 169197 | 128.2 | 143.4 | 580.6 | 39.2 | 79.4 | 139.9 | 17.1 | 45.5 | 0.2 | 1.2 | 7.1 | 22.3 | 23.0 | 4.0 | 1.4 | 4.8 | 2.8 | 1.4 | 1.6 | 0.2 |
| 162116 | 132.2 | 130.3 | 789.8 | 41.1 | 71.3 | 130.0 | 16.7 | 42.8 | 0.3 | 1.1 | 6.3 | 19.7 | 20.7 | 5.2 | 1.2 | 4.2 | 3.4 | 2.2 | 1.1 | 0.1 |
| 155945 | 122.5 | 103.6 | 508.9 | 44.6 | 78.0 | 130.3 | 12.7 | 35.8 | 0.2 | 1.3 | 5.2 | 18.8 | 16.2 | 5.4 | 1.1 | 5.3 | 3.0 | 1.2 | 0.5 | 0.1 |
| 156972 | 110.9 | 116.3 | 379.8 | 40.4 | 124.9 | 116.8 | 12.5 | 35.8 | 0.2 | 1.1 | 5.4 | 17.3 | 16.7 | 6.2 | 1.1 | 4.9 | 2.5 | 2.2 | <LOD | 0.1 |
| 163591 | 127.4 | 101.3 | 469.6 | 40.0 | 106.2 | 132.9 | 11.7 | 34.7 | 0.1 | 1.1 | 5.0 | 18.5 | 17.3 | 4.3 | 1.5 | 3.4 | 2.9 | 1.3 | 0.8 | 0.2 |
| 155492 | 123.2 | 110.4 | 467.7 | 38.1 | 77.0 | 130.4 | 13.9 | 32.2 | 0.2 | 1.0 | 5.0 | 17.8 | 14.4 | 4.5 | 1.1 | 4.8 | 2.2 | 1.0 | 0.8 | <LOD |
| 170977 | 124.1 | 93.7 | 381.2 | 37.6 | 78.3 | 132.4 | 12.3 | 32.9 | 0.1 | 0.9 | 5.2 | 16.6 | 17.3 | 3.3 | 0.5 | 3.9 | 2.9 | 1.7 | 1.4 | 0.2 |
| 150717 | 128.4 | 77.1 | 259.6 | 36.7 | 79.7 | 132.8 | 12.5 | 26.1 | 0.1 | 1.1 | 4.6 | 17.2 | 14.9 | 4.7 | 1.1 | 2.9 | 3.5 | 1.1 | 1.0 | 0.1 |
| 160033 | 123.1 | 129.5 | 348.1 | 35.4 | 98.7 | 140.6 | 13.2 | 27.1 | 0.1 | 1.2 | 5.0 | 17.6 | 13.7 | 4.5 | 0.8 | 4.8 | 3.6 | 1.6 | 1.2 | 0.2 |
| 170393 | 116.1 | 113.8 | 367.1 | 33.4 | 77.9 | 143.8 | 13.0 | 29.4 | 0.2 | 0.8 | 4.8 | 18.0 | 16.2 | 3.6 | 1.0 | 3.8 | 3.4 | 1.0 | 2.6 | 0.1 |
| 159922 | 101.8 | 89.9 | 368.7 | 37.0 | 72.9 | 143.5 | 13.2 | 30.3 | 0.1 | 0.8 | 5.7 | 15.6 | 16.1 | 4.8 | 0.7 | 4.3 | 3.6 | 0.9 | 1.2 | 0.2 |
| 157852 | 113.8 | 98.8 | 309.5 | 30.2 | 87.9 | 146.5 | 13.8 | 31.7 | 0.1 | 0.9 | 6.2 | 18.1 | 19.4 | 5.5 | 1.1 | 4.6 | 2.2 | 1.9 | 0.7 | 0.1 |
| 151646 | 103.6 | 104.1 | 293.1 | 37.4 | 90.3 | 154.4 | 13.8 | 30.5 | 0.2 | 0.6 | 5.1 | 19.0 | 16.4 | 4.3 | 1.2 | 4.0 | 2.8 | 1.2 | 1.1 | <LOD |
| 163232 | 109.4 | 96.9 | 358.3 | 39.9 | 74.3 | 156.5 | 15.0 | 37.3 | 0.1 | 0.9 | 6.2 | 19.3 | 15.9 | 3.8 | 0.8 | 4.9 | 3.6 | 1.6 | 1.2 | <LOD |
| 157825 | 117.9 | 96.7 | 301.8 | 33.5 | 83.3 | 145.9 | 13.2 | 30.5 | 0.2 | 0.6 | 6.4 | 20.5 | 21.4 | 3.4 | 1.1 | 3.2 | 3.9 | 1.5 | 0.6 | <LOD |
| 128151 | 106.4 | 111.6 | 335.7 | 34.2 | 94.9 | 154.7 | 13.0 | 28.9 | 0.1 | 0.8 | 5.8 | 18.4 | 12.9 | 4.6 | 1.3 | 5.4 | 3.0 | 1.6 | <LOD | 0.1 |
| 136613 | 126.0 | 116.9 | 271.4 | 35.5 | 91.6 | 167.0 | 13.9 | 28.5 | 0.1 | 1.6 | 7.3 | 21.1 | 14.6 | 4.5 | 1.0 | 4.6 | 4.4 | 0.9 | 1.2 | 0.1 |
| 154302 | 110.4 | 113.5 | 355.0 | 38.4 | 113.7 | 181.2 | 14.1 | 35.0 | 0.1 | 0.6 | 7.5 | 20.6 | 17.6 | 5.6 | 1.4 | 2.1 | 3.4 | 1.7 | 1.3 | 0.3 |
| 157005 | 105.0 | 109.4 | 212.4 | 48.9 | 118.7 | 170.9 | 17.0 | 37.0 | 0.2 | 0.8 | 6.9 | 22.2 | 19.6 | 5.8 | 1.3 | 2.7 | 3.2 | 1.5 | <LOD | 0.3 |
| 154905 | 102.9 | 104.2 | 433.4 | 35.5 | 77.3 | 172.9 | 15.0 | 31.5 | 0.2 | 1.6 | 6.4 | 24.0 | 13.1 | 3.4 | 0.8 | 4.0 | 2.7 | 1.0 | 0.9 | 0.1 |
| 150605 | 106.0 | 103.6 | 362.5 | 30.4 | 98.8 | 150.0 | 14.8 | 30.1 | 0.2 | 3.0 | 6.8 | 20.4 | 13.8 | 3.9 | 0.8 | 4.6 | 4.1 | 1.9 | 1.1 | 0.1 |
| 170604 | 108.3 | 120.3 | 334.2 | 34.3 | 99.7 | 162.5 | 13.8 | 32.9 | 0.3 | 4.6 | 7.0 | 21.0 | 21.4 | 4.0 | 1.4 | 4.5 | 2.7 | 1.5 | 1.1 | 0.2 |

| AT12.7track1 | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 24058 | 6.0 | 42.5 | <LOD | 5.9 | <LOD | 436.8 | 21.4 | 284.3 | 40.7 | 526.9 | 87.8 | 155.6 | 53.8 | 4.8 | 1.3 | 7.1 | 2.8 | 2.2 | 2.4 | 0.3 |
| 21547 | 6.9 | 36.9 | <LOD | 3.6 | <LOD | 449.7 | 28.7 | 241.7 | 37.3 | 604.4 | 80.6 | 142.7 | 42.1 | 6.6 | 1.2 | 5.3 | 5.2 | 2.1 | 2.8 | 0.4 |
| 29512 | 7.6 | 36.7 | <LOD | 5.1 | 7.0 | 567.4 | 29.6 | 245.3 | 36.2 | 732.1 | 93.4 | 179.6 | 55.3 | 14.1 | 1.6 | 9.7 | 6.2 | 4.7 | 4.1 | 0.5 |
| 41713 | 9.1 | 46.0 | <LOD | 7.5 | <LOD | 555.4 | 36.7 | 213.2 | 31.7 | 691.6 | 104.9 | 205.7 | 87.4 | 12.6 | 2.2 | 11.0 | 9.5 | 5.0 | 5.2 | 0.7 |
| 68557 | 12.0 | 88.2 | <LOD | 13.8 | 11.8 | 629.9 | 61.6 | 218.6 | 30.3 | 726.3 | 190.6 | 387.3 | 150.7 | 28.8 | 4.4 | 19.9 | 20.3 | 9.2 | 7.7 | 0.9 |
| 106134 | 22.5 | 120.0 | <LOD | 21.7 | 11.3 | 721.9 | 121.3 | 241.4 | 29.8 | 641.1 | 274.0 | 564.8 | 255.2 | 48.5 | 4.6 | 34.8 | 24.3 | 12.2 | 9.8 | 1.0 |
| 162844 | 24.3 | 153.3 | <LOD | 30.2 | 21.8 | 749.9 | 146.7 | 215.4 | 28.0 | 590.2 | 366.7 | 799.1 | 340.5 | 59.0 | 6.3 | 48.5 | 30.2 | 15.8 | 10.7 | 1.7 |
| 148943 | 35.6 | 180.4 | <LOD | 39.2 | 18.8 | 730.9 | 168.2 | 206.0 | 24.3 | 509.3 | 427.1 | 854.5 | 404.4 | 77.2 | 6.6 | 52.9 | 42.9 | 15.5 | 15.5 | 2.0 |
| 168500 | 45.2 | 214.3 | <LOD | 53.7 | 16.4 | 701.6 | 177.0 | 177.9 | 20.1 | 438.5 | 454.8 | 910.6 | 431.6 | 87.5 | 8.2 | 55.4 | 41.7 | 15.7 | 14.6 | 2.2 |
| 203694 | 41.1 | 212.3 | <LOD | 55.5 | 24.3 | 701.0 | 176.0 | 178.3 | 18.3 | 345.7 | 445.7 | 955.4 | 411.2 | 89.0 | 8.1 | 75.0 | 40.9 | 16.5 | 14.9 | 1.8 |
| 194397 | 48.7 | 238.7 | <LOD | 53.1 | 32.9 | 719.5 | 186.0 | 167.3 | 15.0 | 257.0 | 433.4 | 850.7 | 346.2 | 62.8 | 8.0 | 47.0 | 35.6 | 16.0 | 14.7 | 2.1 |
| 195146 | 62.7 | 263.9 | <LOD | 52.0 | 50.8 | 540.5 | 161.0 | 155.3 | 13.2 | 199.9 | 316.3 | 698.1 | 293.0 | 58.4 | 7.2 | 40.1 | 26.7 | 12.5 | 10.1 | 1.2 |
| 210783 | 68.0 | 256.5 | <LOD | 58.3 | 49.1 | 475.3 | 114.8 | 128.1 | 10.4 | 159.4 | 245.2 | 515.7 | 228.5 | 40.8 | 5.2 | 30.1 | 21.7 | 11.2 | 10.0 | 1.1 |
| 187230 | 71.6 | 299.3 | <LOD | 56.7 | 65.1 | 383.7 | 114.9 | 116.0 | 7.8 | 118.1 | 160.5 | 355.2 | 172.2 | 36.1 | 3.0 | 25.7 | 19.3 | 10.2 | 10.2 | 1.2 |
| 218947 | 72.4 | 312.6 | <LOD | 75.7 | 67.2 | 384.6 | 96.7 | 102.8 | 5.7 | 106.1 | 134.2 | 332.4 | 144.0 | 32.4 | 4.6 | 21.1 | 19.7 | 8.7 | 6.2 | 0.7 |
| 209541 | 74.5 | 266.4 | <LOD | 68.8 | 95.7 | 330.4 | 78.7 | 86.6 | 4.5 | 85.3 | 110.4 | 241.5 | 141.6 | 26.4 | 3.7 | 20.2 | 19.9 | 8.3 | 9.5 | 0.7 |
| 225039 | 77.2 | 370.4 | <LOD | 65.6 | 89.7 | 359.5 | 76.7 | 79.6 | 2.3 | 60.0 | 113.2 | 236.6 | 124.5 | 22.6 | 5.2 | 22.2 | 18.6 | 7.2 | 6.4 | 0.9 |
| 220917 | 89.5 | 324.1 | 42.5 | 82.3 | 61.7 | 306.4 | 81.4 | 80.6 | 1.9 | 42.6 | 100.5 | 246.7 | 119.4 | 27.6 | 3.5 | 26.6 | 17.5 | 7.4 | 7.9 | 0.9 |
| 227175 | 76.2 | 316.8 | 38.8 | 67.2 | 78.9 | 345.9 | 71.5 | 70.9 | 1.4 | 27.8 | 82.9 | 197.2 | 111.7 | 21.9 | 3.5 | 19.7 | 15.7 | 7.2 | 5.5 | 0.7 |
| 248086 | 76.0 | 327.4 | <LOD | 68.2 | 55.9 | 283.6 | 72.6 | 61.6 | 1.1 | 16.6 | 64.5 | 154.2 | 89.7 | 27.3 | 3.0 | 19.3 | 15.6 | 5.3 | 4.7 | 0.4 |
| 194757 | 83.0 | 368.8 | 24.7 | 83.3 | 78.1 | 264.7 | 67.8 | 74.4 | 0.7 | 12.0 | 50.8 | 138.5 | 88.5 | 21.1 | 3.5 | 16.0 | 11.9 | 7.2 | 6.0 | 0.8 |
| 241146 | 76.6 | 355.1 | 32.2 | 67.8 | 96.1 | 258.5 | 60.8 | 80.7 | 0.7 | 10.8 | 41.0 | 126.0 | 86.8 | 15.4 | 2.9 | 17.3 | 12.6 | 4.5 | 6.8 | 0.6 |
| 215580 | 81.1 | 354.0 | 26.2 | 75.1 | 84.9 | 265.3 | 62.2 | 85.7 | 0.9 | 14.4 | 33.5 | 89.7 | 65.4 | 19.0 | 3.2 | 14.1 | 11.3 | 6.0 | 5.9 | 0.7 |
| 224400 | 71.3 | 370.4 | 23.1 | 79.8 | 71.1 | 252.7 | 52.2 | 86.8 | 0.7 | 14.8 | 31.6 | 87.6 | 61.1 | 15.5 | 2.0 | 11.5 | 9.6 | 6.6 | 5.1 | 0.6 |
| 232412 | 85.9 | 351.0 | <LOD | 77.7 | 69.8 | 245.0 | 56.2 | 87.3 | 1.0 | 15.0 | 28.5 | 81.2 | 73.0 | 16.1 | 2.5 | 13.7 | 13.2 | 5.1 | 6.6 | 0.6 |
| 224732 | 82.7 | 422.6 | 81.6 | 82.4 | 90.0 | 270.9 | 52.9 | 97.7 | 0.8 | 13.8 | 26.5 | 81.4 | 59.2 | 15.5 | 2.1 | 12.8 | 12.0 | 6.8 | 5.0 | 0.5 |
| 219160 | 103.4 | 349.4 | 82.0 | 83.1 | 98.7 | 278.6 | 48.3 | 96.9 | 0.7 | 10.0 | 22.5 | 68.5 | 67.7 | 10.7 | 2.5 | 13.2 | 10.1 | 5.7 | 4.1 | 0.5 |
| 214495 | 79.2 | 289.2 | 98.7 | 71.2 | 100.9 | 253.8 | 45.9 | 86.4 | 0.7 | 5.0 | 18.8 | 61.8 | 49.1 | 12.0 | 2.4 | 10.8 | 9.3 | 5.0 | 3.5 | 0.5 |
| 259996 | 91.9 | 334.1 | 170.5 | 93.9 | 98.0 | 247.2 | 45.6 | 81.5 | 0.5 | 4.5 | 20.3 | 64.7 | 54.3 | 11.7 | 2.2 | 11.4 | 5.8 | 4.3 | 4.7 | 0.5 |
| 177817 | 85.1 | 245.7 | 232.5 | 62.4 | 84.8 | 222.7 | 39.1 | 68.7 | 0.3 | 3.6 | 15.4 | 48.9 | 43.9 | 9.4 | 1.7 | 8.4 | 8.2 | 3.6 | 3.6 | 0.4 |
| 210269 | 92.8 | 311.3 | 262.9 | 65.0 | 90.3 | 239.3 | 34.1 | 80.2 | 0.5 | 3.6 | 14.8 | 51.0 | 39.3 | 9.5 | 2.4 | 8.8 | 7.8 | 2.7 | 3.6 | 0.4 |
| 220818 | 100.1 | 289.8 | 288.1 | 65.3 | 87.2 | 237.3 | 31.9 | 59.1 | 0.4 | 3.5 | 14.8 | 50.5 | 41.5 | 8.6 | 1.9 | 10.6 | 7.6 | 4.1 | 3.4 | 0.3 |
| 224804 | 110.6 | 240.0 | 507.2 | 67.7 | 109.6 | 243.4 | 32.8 | 67.7 | 0.4 | 3.5 | 15.8 | 53.0 | 43.7 | 9.7 | 1.7 | 8.2 | 7.1 | 3.3 | 3.7 | 0.4 |
| 221798 | 96.3 | 222.4 | 521.1 | 56.7 | 89.4 | 231.9 | 26.4 | 59.7 | 0.4 | 2.2 | 13.1 | 47.1 | 30.0 | 9.1 | 1.6 | 6.0 | 6.4 | 3.6 | 3.3 | 0.5 |
| 218174 | 104.4 | 224.0 | 583.9 | 70.0 | 141.4 | 246.1 | 30.6 | 62.6 | 0.6 | 2.6 | 13.5 | 40.7 | 40.7 | 8.8 | 1.8 | 7.1 | 4.9 | 3.0 | 1.2 | 0.3 |
| 235300 | 104.1 | 222.6 | 511.3 | 61.9 | 137.9 | 239.4 | 26.7 | 52.0 | 0.5 | 3.2 | 13.0 | 42.0 | 31.2 | 8.0 | 1.4 | 10.1 | 4.3 | 2.1 | 3.0 | 0.4 |
| 226959 | 113.8 | 223.3 | 691.9 | 58.3 | 131.6 | 293.9 | 23.7 | 52.0 | 0.3 | 2.3 | 12.6 | 36.0 | 31.9 | 6.7 | 1.8 | 7.5 | 5.3 | 2.6 | 2.2 | 0.4 |
| 245768 | 130.4 | 183.4 | 744.0 | 61.2 | 161.9 | 274.6 | 25.6 | 55.0 | 0.5 | 3.0 | 13.0 | 49.9 | 31.6 | 7.6 | 2.1 | 7.9 | 4.8 | 2.1 | 1.8 | 0.3 |
| 239421 | 112.2 | 186.5 | 546.3 | 64.5 | 117.4 | 263.2 | 25.7 | 49.5 | 0.7 | 1.8 | 11.1 | 35.7 | 27.6 | 5.9 | 1.5 | 5.3 | 3.4 | 2.0 | 1.7 | 0.2 |
| 190369 | 103.4 | 180.1 | 630.0 | 52.1 | 118.5 | 241.6 | 19.9 | 40.4 | 0.4 | 2.4 | 10.9 | 32.0 | 29.3 | 6.4 | 1.8 | 4.8 | 2.6 | 0.8 | 1.5 | 0.2 |
| 204384 | 107.3 | 172.4 | 752.3 | 53.1 | 136.3 | 232.3 | 19.8 | 35.1 | 0.2 | 1.6 | 8.7 | 34.9 | 20.2 | 8.0 | 1.7 | 3.0 | 3.1 | 2.2 | 1.4 | 0.1 |
| 215426 | 104.9 | 125.1 | 1342.6 | 69.6 | 140.5 | 215.3 | 14.8 | 29.8 | 0.2 | 1.8 | 9.5 | 29.9 | 19.5 | 4.3 | 1.4 | 4.5 | 1.9 | 1.8 | 1.7 | <LOD |
| 272500 | 133.3 | 197.0 | 1175.9 | 54.5 | 165.6 | 275.9 | 18.7 | 36.7 | 0.4 | 2.3 | 11.2 | 35.2 | 25.5 | 5.4 | 1.7 | 4.4 | 4.5 | 2.4 | <LOD | <LOD |
| 266249 | 131.0 | 189.9 | 1395.4 | 51.9 | 151.8 | 217.1 | 14.9 | 36.7 | 0.1 | 2.2 | 6.5 | 28.1 | 20.6 | 5.8 | 1.3 | 4.9 | 2.9 | 0.7 | 1.8 | 0.1 |
| 239517 | 115.8 | 119.5 | 1694.4 | 58.8 | 122.5 | 225.3 | 15.7 | 24.6 | 0.1 | 2.0 | 7.3 | 24.1 | 22.2 | 7.4 | 1.4 | 5.6 | 4.4 | 1.2 | 1.3 | 0.2 |
| 264451 | 138.6 | 141.3 | 1772.8 | 54.6 | 161.8 | 209.0 | 15.3 | 26.9 | 0.2 | 1.9 | 7.1 | 25.9 | 26.9 | 5.4 | 1.1 | 5.3 | 3.2 | 1.5 | 1.1 | 0.2 |
| 218913 | 122.5 | 140.0 | 1288.1 | 52.9 | 149.9 | 200.4 | 17.0 | 38.6 | 0.3 | 2.0 | 9.7 | 30.8 | 26.6 | 7.9 | 1.3 | 6.1 | 3.7 | 1.7 | 2.2 | 0.2 |
| 236466 | 132.6 | 135.3 | 1304.4 | 54.9 | 121.1 | 225.6 | 16.3 | 37.1 | 0.2 | 1.9 | 10.2 | 29.4 | 18.7 | 5.8 | 1.4 | 5.4 | 3.3 | 1.6 | 2.3 | 0.6 |
| 214103 | 121.4 | 168.2 | 1395.7 | 47.1 | 188.6 | 203.9 | 19.5 | 38.9 | 0.2 | 1.7 | 10.2 | 33.6 | 29.1 | 6.0 | 2.2 | 6.0 | 3.8 | 2.3 | 1.3 | 0.2 |
| 238936 | 125.8 | 206.4 | 1623.9 | 50.5 | 117.2 | 213.4 | 23.4 | 40.5 | 0.2 | 1.9 | 15.4 | 40.8 | 26.9 | 8.9 | 1.8 | 8.0 | 4.6 | 2.2 | 2.4 | 0.3 |
| 234731 | 119.5 | 233.4 | 1192.1 | 56.5 | 104.0 | 223.4 | 23.3 | 58.8 | 0.3 | 1.7 | 13.4 | 47.2 | 34.1 | 9.6 | 2.1 | 8.2 | 5.6 | 2.6 | 3.6 | 0.2 |
| 226783 | 134.9 | 255.9 | 822.2 | 57.8 | 127.4 | 247.1 | 29.9 | 63.8 | 0.4 | 2.0 | 14.9 | 53.3 | 38.6 | 11.5 | 1.9 | 9.3 | 5.1 | 3.2 | 2.0 | 0.7 |
| 232414 | 123.7 | 262.5 | 726.6 | 64.6 | 113.7 | 216.9 | 29.1 | 75.1 | 0.3 | 1.9 | 15.5 | 57.0 | 45.1 | 10.9 | 2.2 | 8.5 | 7.1 | 3.7 | 2.3 | 0.6 |
| 207932 | 112.3 | 266.9 | 908.4 | 56.3 | 112.7 | 267.6 | 30.8 | 72.3 | 0.5 | 1.9 | 17.0 | 58.8 | 46.7 | 14.3 | 3.2 | 8.9 | 7.6 | 3.9 | 1.8 | 0.6 |
| 215590 | 120.2 | 306.4 | 627.1 | 67.1 | 118.2 | 265.1 | 32.4 | 94.0 | 0.4 | 2.1 | 19.2 | 65.5 | 50.3 | 15.3 | 2.2 | 13.6 | 6.2 | 4.8 | 3.3 | 0.5 |
| 248144 | 123.2 | 310.2 | 864.0 | 61.3 | 90.9 | 278.3 | 40.2 | 99.7 | 0.5 | 1.8 | 22.6 | 74.9 | 64.0 | 13.1 | 2.3 | 13.5 | 8.1 | 2.0 | 3.6 | 0.6 |
| 216904 | 118.8 | 330.2 | 737.1 | 59.4 | 91.2 | 270.2 | 39.9 | 94.3 | 0.5 | 1.7 | 21.7 | 67.1 | 62.7 | 16.1 | 2.7 | 12.5 | 13.1 | 3.7 | 4.2 | 0.3 |
| 243302 | 121.8 | 344.8 | 439.4 | 63.1 | 100.3 | 289.0 | 40.5 | 91.0 | 0.6 | 1.9 | 20.8 | 82.5 | 63.7 | 16.9 | 2.5 | 13.9 | 8.6 | 4.9 | 3.9 | 0.5 |
| 250470 | 112.3 | 331.2 | 410.6 | 82.5 | 90.6 | 284.2 | 45.4 | 98.0 | 0.5 | 2.2 | 20.9 | 72.9 | 47.9 | 12.4 | 2.5 | 12.9 | 8.9 | 4.5 | 3.0 | 0.4 |
| 245790 | 121.7 | 349.5 | 519.2 | 66.7 | 68.3 | 280.8 | 42.5 | 110.7 | 0.6 | 2.0 | 24.4 | 81.3 | 67.9 | 16.5 | 3.5 | 10.7 | 10.2 | 4.2 | 3.1 | 0.6 |
| 258033 | 117.3 | 360.5 | 391.8 | 62.9 | 103.2 | 286.6 | 44.5 | 104.5 | 0.8 | 2.4 | 24.1 | 72.7 | 65.5 | 18.2 | 3.5 | 15.2 | 9.4 | 4.1 | 2.2 | 0.6 |
| 245090 | 106.0 | 428.9 | 227.8 | 78.0 | 92.8 | 268.8 | 44.1 | 113.9 | 0.2 | 1.8 | 23.7 | 76.9 | 60.6 | 14.9 | 3.4 | 10.1 | 8.1 | 6.3 | 2.7 | 0.5 |
| 245725 | 100.6 | 348.4 | 201.1 | 69.3 | 81.6 | 270.4 | 40.8 | 111.8 | 0.5 | 1.8 | 23.7 | 75.6 | 66.9 | 17.5 | 3.7 | 10.3 | 9.7 | 4.4 | 4.0 | 0.6 |
| 239216 | 110.9 | 429.3 | 211.0 | 63.8 | 65.2 | 276.5 | 44.1 | 111.6 | 0.5 | 1.7 | 21.3 | 78.3 | 57.1 | 15.7 | 3.1 | 14.5 | 8.4 | 4.1 | 5.8 | 0.4 |
| 230569 | 104.2 | 391.2 | 121.5 | 69.6 | 92.4 | 284.7 | 47.5 | 116.1 | 0.5 | 2.5 | 27.7 | 78.0 | 74.8 | 12.3 | 3.8 | 13.6 | 10.5 | 5.6 | 4.8 | 0.4 |
| 244358 | 113.6 | 403.4 | 119.3 | 70.3 | 101.7 | 299.9 | 45.0 | 107.2 | 0.6 | 1.8 | 26.1 | 83.2 | 58.0 | 18.1 | 4.0 | 13.6 | 8.8 | 5.4 | 4.7 | 0.5 |
| 252270 | 118.9 | 420.2 | 123.4 | 73.0 | 67.6 | 307.2 | 52.9 | 131.5 | 0.7 | 1.9 | 29.2 | 87.3 | 57.3 | 15.1 | 3.5 | 16.1 | 11.3 | 4.7 | 4.5 | 0.8 |
| 222417 | 111.1 | 417.6 | 86.8 | 71.7 | 76.3 | 267.2 | 44.8 | 122.3 | 0.3 | 3.0 | 26.6 | 86.4 | 65.8 | 17.2 | 3.4 | 17.3 | 8.2 | 5.2 | 5.1 | 0.5 |
| 228421 | 108.6 | 401.6 | 56.7 | 68.3 | 54.3 | 284.0 | 45.8 | 122.4 | 0.6 | 1.7 | 26.9 | 86.1 | 67.3 | 16.5 | 3.3 | 16.1 | 11.8 | 4.9 | 3.9 | 0.5 |
| 219180 | 108.0 | 382.2 | 80.4 | 56.4 | 97.4 | 287.4 | 47.1 | 110.9 | 0.4 | 1.4 | 25.5 | 94.7 | 68.3 | 14.6 | 3.7 | 16.4 | 16.4 | 5.8 | 3.3 | 0.4 |
| 224942 | 115.2 | 420.1 | 59.5 | 62.2 | 88.7 | 287.3 | 48.7 | 127.6 | 0.6 | 1.9 | 26.4 | 92.8 | 80.8 | 19.3 | 3.8 | 13.2 | 10.4 | 5.5 | 3.0 | 0.7 |
| 227998 | 110.7 | 365.5 | 48.6 | 77.3 | 63.9 | 264.4 | 48.4 | 111.4 | 0.3 | 1.8 | 27.3 | 83.5 | 64.4 | 16.7 | 3.0 | 18.1 | 7.4 | 4.9 | 4.8 | 0.7 |
| 234204 | 108.8 | 396.1 | 87.1 | 69.7 | 57.8 | 286.6 | 43.2 | 120.8 | 0.5 | 1.4 | 25.3 | 89.6 | 60.1 | 16.7 | 2.6 | 13.5 | 11.2 | 4.6 | 2.5 | 0.7 |
| 218804 | 114.2 | 353.1 | 148.9 | 62.9 | 82.3 | 263.5 | 45.3 | 105.1 | 0.4 | 1.8 | 26.0 | 76.9 | 56.6 | 17.2 | 3.0 | 13.0 | 10.1 | 6.2 | 4.0 | 0.5 |
| 257773 | 119.9 | 374.0 | 204.3 | 58.8 | 99.0 | 300.5 | 47.0 | 110.4 | 0.6 | 1.8 | 25.9 | 75.9 | 62.4 | 20.5 | 4.3 | 13.6 | 8.2 | 4.2 | 3.2 | 0.9 |
| 225066 | 128.2 | 314.2 | 194.1 | 65.3 | 50.9 | 264.0 | 42.5 | 99.4 | 0.4 | 1.5 | 22.2 | 72.8 | 52.8 | 14.8 | 3.3 | 11.0 | 11.9 | 2.9 | 3.5 | 0.3 |
| 243577 | 132.7 | 307.8 | 306.4 | 71.8 | 78.2 | 271.5 | 43.8 | 98.3 | 0.4 | 1.6 | 23.5 | 73.5 | 52.2 | 20.6 | 3.1 | 15.5 | 9.4 | 4.8 | 3.4 | 0.6 |
| 225006 | 125.9 | 312.5 | 339.8 | 72.6 | 73.1 | 270.7 | 41.6 | 87.8 | 0.5 | 1.5 | 19.5 | 65.8 | 51.2 | 15.2 | 2.5 | 11.4 | 8.3 | 4.8 | 5.2 | 0.9 |
| 259005 | 136.1 | 275.2 | 281.6 | 76.7 | 89.4 | 268.4 | 40.9 | 89.0 | 0.5 | 1.4 | 19.9 | 72.5 | 50.7 | 15.5 | 3.4 | 14.0 | 6.5 | 3.9 | 5.4 | 0.8 |
| 224502 | 116.9 | 270.2 | 395.1 | 74.7 | 61.4 | 257.4 | 38.5 | 80.1 | 0.3 | 1.2 | 16.7 | 60.4 | 45.4 | 14.0 | 1.9 | 10.0 | 5.9 | 4.0 | 2.1 | 0.4 |
| 242680 | 138.7 | 261.5 | 332.9 | 64.2 | 92.5 | 267.5 | 38.3 | 90.3 | 0.3 | 1.2 | 20.6 | 67.3 | 53.1 | 14.5 | 3.2 | 11.6 | 8.5 | 3.9 | 3.7 | 0.7 |
| 254131 | 142.8 | 285.3 | 224.6 | 84.5 | 62.3 | 281.6 | 38.6 | 82.1 | 0.3 | 1.5 | 19.1 | 71.0 | 48.0 | 11.6 | 2.1 | 11.6 | 7.0 | 4.3 | 2.0 | 0.7 |
| 252288 | 144.3 | 261.3 | 425.5 | 75.5 | 57.0 | 283.8 | 39.2 | 85.9 | 0.4 | 1.6 | 20.6 | 65.2 | 47.5 | 11.5 | 2.8 | 14.8 | 9.3 | 3.2 | 2.7 | 0.5 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 231720 | 147.4 | 273.4 | 333.6 | 67.8 | 68.7 | 298.4 | 42.9 | 90.5 | 0.5 | 2.0 | 20.1 | 71.0 | 51.7 | 12.3 | 2.4 | 9.8 | 9.5 | 4.6 | 4.3 | 0.4 |
| 208570 | 128.8 | 237.4 | 400.9 | 65.5 | 67.8 | 286.4 | 39.2 | 85.3 | 0.5 | 3.0 | 20.3 | 67.6 | 51.5 | 13.7 | 2.8 | 13.8 | 6.3 | 3.5 | 5.1 | 0.4 |
| 288496 | 142.9 | 263.6 | 379.0 | 74.3 | 81.5 | 311.1 | 42.8 | 85.3 | 0.5 | 11.7 | 22.6 | 69.8 | 67.0 | 11.6 | 3.5 | 14.0 | 7.8 | 3.8 | 3.6 | 0.7 |
| 238505 | 119.4 | 254.0 | 498.1 | 62.0 | 55.5 | 308.4 | 40.5 | 87.8 | 1.3 | 29.6 | 19.2 | 68.3 | 50.3 | 14.8 | 2.4 | 8.3 | 8.3 | 2.9 | 2.1 | 0.6 |
| 259832 | 145.8 | 274.4 | 457.9 | 79.7 | 87.4 | 386.6 | 42.8 | 99.0 | 1.6 | 68.0 | 23.8 | 83.6 | 79.0 | 10.7 | 3.3 | 13.8 | 9.7 | 5.2 | 4.0 | 0.6 |
| 218628 | 127.8 | 255.6 | 531.6 | 67.6 | 49.9 | 394.2 | 39.2 | 107.9 | 2.5 | 106.6 | 22.3 | 71.6 | 47.4 | 11.5 | 2.8 | 12.5 | 6.1 | 4.7 | 5.1 | 0.5 |
| 223947 | 132.6 | 276.5 | 412.1 | 70.5 | 58.4 | 470.8 | 43.5 | 106.7 | 3.3 | 181.5 | 28.8 | 81.3 | 50.5 | 14.6 | 3.6 | 13.2 | 9.1 | 4.1 | 3.9 | 0.5 |
| AT12.7track2 | | | | | | | | | | | | | | | | | | | | |
| 41777 | 8.7 | 36.8 | <LOD | 4.3 | <LOD | 2214.6 | 11.2 | 77.4 | 11.2 | 2412.4 | 29.6 | 58.2 | 24.6 | 2.4 | 1.2 | 4.2 | 3.1 | 0.9 | 1.5 | 0.2 |
| 46579 | 10.4 | 83.5 | <LOD | 10.0 | 16.4 | 1729.3 | 17.4 | 75.4 | 11.0 | 2069.5 | 39.8 | 73.7 | 32.5 | 4.9 | 1.7 | 4.1 | 3.6 | 3.2 | 2.6 | 0.3 |
| 59393 | 16.1 | 82.8 | <LOD | 15.1 | 10.4 | 1650.6 | 25.5 | 83.9 | 9.4 | 1823.8 | 40.4 | 77.3 | 39.3 | 6.9 | 1.6 | 6.0 | 5.7 | 3.4 | 1.6 | 0.5 |
| 64062 | 24.9 | 108.1 | <LOD | 24.0 | 12.6 | 1237.5 | 26.6 | 84.5 | 10.3 | 1339.8 | 37.6 | 74.0 | | 9.6 | 1.3 | 8.0 | 7.0 | 2.6 | 4.2 | 0.3 |
| 98730 | 33.9 | 151.0 | <LOD | 23.5 | 17.7 | 1131.4 | 35.3 | 94.7 | 8.9 | 1219.9 | 38.6 | 80.2 | 43.0 | 14.7 | 2.0 | 9.3 | 8.5 | 5.5 | 5.2 | 0.7 |
| 108649 | 39.8 | 164.6 | <LOD | 29.3 | 22.9 | 888.0 | 36.3 | 85.0 | 7.9 | 927.2 | 29.4 | 69.3 | 52.5 | 11.0 | 1.4 | 8.6 | 6.4 | 5.2 | 4.2 | 0.6 |
| 104473 | 43.5 | 176.6 | <LOD | 32.2 | 35.8 | 667.6 | 33.4 | 79.5 | 4.9 | 657.4 | 22.9 | 67.8 | 45.9 | 11.1 | 1.2 | 10.7 | 9.2 | 5.6 | 3.7 | 0.5 |
| 125261 | 45.3 | 216.8 | <LOD | 34.1 | 22.4 | 528.5 | 40.6 | 80.4 | 4.7 | 438.9 | 25.2 | 69.0 | 45.5 | 13.5 | 1.9 | 9.6 | 7.9 | 4.7 | 5.5 | 0.6 |
| 135838 | 59.5 | 237.1 | <LOD | 53.8 | 38.5 | 375.7 | 42.3 | 75.5 | 3.8 | 277.2 | 24.1 | 70.1 | 50.0 | 18.3 | 1.9 | 12.5 | 9.2 | 6.3 | 4.2 | 0.6 |
| 135833 | 59.7 | 214.2 | 22.0 | 50.7 | 43.8 | 270.5 | 44.5 | 75.1 | 2.7 | 150.8 | 23.1 | 65.4 | 45.7 | 11.9 | 2.0 | 13.3 | 7.6 | 5.3 | 4.3 | 0.5 |
| 135360 | 59.9 | 247.1 | 37.3 | 54.0 | 55.0 | 239.7 | 47.6 | 70.3 | 2.2 | 77.2 | 20.9 | 59.6 | 55.7 | 14.3 | 1.9 | 12.4 | 13.1 | 4.9 | 5.4 | 0.6 |
| 142855 | 66.8 | 228.8 | 18.4 | 44.2 | 49.2 | 187.4 | 43.1 | 67.5 | 1.4 | 44.9 | 18.6 | 64.0 | 46.7 | 15.8 | 1.7 | 9.2 | 11.5 | 4.7 | 5.7 | 0.9 |
| 149689 | 74.4 | 238.7 | 30.4 | 44.4 | 45.3 | 184.5 | 45.9 | 62.2 | 0.9 | 26.4 | 18.3 | 67.2 | 51.7 | 13.9 | 2.0 | 14.1 | 10.3 | 5.4 | 5.0 | 0.6 |
| 141447 | 63.8 | 266.0 | 45.6 | 46.4 | 71.2 | 168.3 | 48.3 | 64.3 | 0.6 | 20.7 | 20.8 | 68.7 | 51.7 | 14.7 | 2.0 | 10.0 | 8.0 | 6.0 | 4.2 | 0.7 |
| 153168 | 67.8 | 250.7 | 32.2 | 47.6 | 45.6 | 172.6 | 45.0 | 65.3 | 0.7 | 17.7 | 19.9 | 67.7 | 46.8 | 14.9 | 2.3 | 15.4 | 10.4 | 5.4 | 6.3 | 0.5 |
| 139540 | 60.7 | 238.6 | 32.4 | 47.3 | 62.8 | 163.2 | 49.0 | 63.8 | 0.7 | 17.2 | 18.8 | 63.1 | 49.9 | 15.1 | 2.1 | 12.3 | 9.0 | 4.8 | 4.6 | 0.6 |
| 140866 | 62.9 | 262.4 | 38.0 | 48.2 | 61.7 | 170.7 | 43.4 | 63.3 | 0.7 | 19.6 | 17.5 | 60.5 | 45.3 | 13.6 | 1.8 | 11.1 | 9.4 | 3.6 | 4.0 | 0.4 |
| 151440 | 73.1 | 248.3 | 40.1 | 56.6 | 48.4 | 162.7 | 47.9 | 60.6 | 0.7 | 20.1 | 18.6 | 58.4 | 40.7 | 10.9 | 1.9 | 13.2 | 10.2 | 4.8 | 5.2 | 0.5 |
| 157675 | 69.0 | 235.4 | 58.4 | 50.6 | 57.5 | 188.6 | 48.7 | 60.5 | 0.8 | 20.1 | 19.0 | 66.2 | 52.4 | 13.4 | 2.2 | 11.3 | 11.6 | 4.2 | 5.8 | 0.6 |
| 147210 | 63.9 | 247.4 | 37.3 | 46.0 | 56.9 | 166.5 | 40.3 | 52.3 | 0.7 | 16.6 | 17.1 | 56.1 | 45.1 | 12.7 | 1.7 | 10.0 | 8.0 | 3.8 | 4.3 | 0.4 |
| 137782 | 72.5 | 243.0 | 61.6 | 43.5 | 56.6 | 158.2 | 44.0 | 57.8 | 0.7 | 14.6 | 17.1 | 54.5 | 42.8 | 10.1 | 1.6 | 9.4 | 8.0 | 4.3 | 4.5 | 0.5 |
| 144462 | 66.2 | 207.4 | 89.0 | 47.7 | 68.2 | 162.4 | 33.1 | 50.8 | 0.4 | 11.1 | 14.9 | 46.4 | 42.4 | 12.3 | 1.8 | 8.1 | 7.5 | 5.3 | 4.0 | 0.4 |
| 156670 | 72.2 | 207.1 | 111.5 | 60.5 | 41.0 | 170.4 | 34.9 | 54.5 | 0.5 | 8.5 | 14.5 | 44.5 | 33.9 | 8.6 | 2.5 | 6.5 | 7.5 | 4.8 | 3.9 | 0.4 |
| 160956 | 75.9 | 219.5 | 184.0 | 53.4 | 65.8 | 172.0 | 32.6 | 53.6 | 0.3 | 6.8 | 14.1 | 49.3 | 36.0 | 9.5 | 1.9 | 8.4 | 7.6 | 4.6 | 3.1 | 0.5 |
| 167049 | 80.1 | 192.4 | 306.3 | 41.0 | 77.6 | 181.4 | 32.4 | 46.3 | 0.3 | 5.9 | 13.1 | 40.2 | 39.1 | 10.5 | 1.8 | 9.0 | 6.7 | 2.8 | 1.6 | 0.4 |
| 151144 | 90.0 | 211.4 | 592.4 | 48.7 | 77.3 | 189.0 | 30.2 | 52.3 | 0.4 | 4.6 | 12.5 | 40.9 | 26.1 | 7.9 | 1.8 | 6.7 | 5.9 | 2.4 | 3.9 | 0.3 |
| 156293 | 97.2 | 174.0 | 579.6 | 45.3 | 85.7 | 185.6 | 23.5 | 50.6 | 0.2 | 4.4 | 11.5 | 35.3 | 33.1 | 8.3 | 1.3 | 6.1 | 5.0 | 2.1 | 1.7 | 0.1 |
| 160782 | 91.2 | 176.4 | 701.5 | 43.5 | 66.2 | 179.4 | 23.4 | 50.3 | 0.3 | 3.4 | 9.5 | 34.8 | 30.8 | 8.6 | 1.3 | 4.4 | 4.0 | 2.8 | 1.7 | 0.2 |
| 173255 | 88.2 | 176.9 | 777.2 | 36.9 | 98.2 | 180.4 | 25.1 | 52.1 | 0.2 | 3.4 | 12.0 | 35.9 | 30.5 | 8.4 | 1.7 | 7.6 | 4.6 | 1.7 | 1.7 | 0.4 |
| 150440 | 87.2 | 169.7 | 869.1 | 40.0 | 74.8 | 171.0 | 23.4 | 59.9 | 0.2 | 3.6 | 12.2 | 36.2 | 28.4 | 8.1 | 1.6 | 6.4 | 5.1 | 2.2 | 1.7 | 0.2 |
| 135707 | 84.5 | 179.4 | 765.6 | 45.1 | 84.6 | 203.0 | 25.2 | 62.3 | 0.3 | 3.4 | 11.2 | 41.8 | 28.3 | 7.6 | 1.9 | 7.8 | 5.5 | 2.5 | 2.5 | 0.2 |
| 169997 | 98.5 | 190.9 | 642.1 | 45.7 | 78.3 | 185.8 | 24.4 | 66.4 | 0.2 | 3.5 | 15.2 | 47.4 | 31.5 | 9.5 | 1.9 | 8.7 | 7.7 | 2.4 | 2.8 | 0.4 |
| 179012 | 104.8 | 263.5 | 843.7 | 46.7 | 82.0 | 212.1 | 30.7 | 83.7 | 0.4 | 3.5 | 16.5 | 56.7 | 36.6 | 9.9 | 2.1 | 8.0 | 7.2 | 2.9 | 1.4 | 0.3 |
| 150620 | 88.8 | 235.1 | 663.5 | 41.3 | 64.1 | 194.1 | 30.1 | 85.8 | 0.5 | 3.6 | 16.2 | 50.2 | 36.6 | 11.5 | 1.7 | 8.4 | 4.8 | 2.9 | 3.3 | 0.5 |
| 148039 | 84.0 | 268.2 | 607.4 | 44.6 | 79.6 | 189.5 | 34.4 | 93.0 | 0.4 | 3.7 | 17.6 | 57.5 | 51.9 | 13.3 | 3.0 | 9.8 | 7.9 | 3.0 | 3.2 | 0.4 |
| 172747 | 84.2 | 300.8 | 387.2 | 44.4 | 60.9 | 197.6 | 39.5 | 97.7 | 0.5 | 3.6 | 20.0 | 64.6 | 54.2 | 15.5 | 2.9 | 10.7 | 8.9 | 3.0 | 2.8 | 0.6 |
| 165682 | 97.0 | 278.7 | 354.4 | 45.2 | 58.0 | 214.2 | 36.2 | 109.7 | 0.5 | 3.8 | 19.8 | 65.3 | 47.8 | 12.9 | 2.9 | 14.0 | 7.9 | 4.8 | 3.2 | 0.6 |
| 161999 | 102.2 | 305.5 | 299.1 | 45.9 | 70.2 | 207.4 | 44.2 | 114.7 | 0.4 | 3.5 | 22.6 | 77.4 | 58.1 | 13.5 | 2.2 | 11.4 | 9.0 | 3.6 | 4.9 | 0.4 |
| 159977 | 88.2 | 301.7 | 168.4 | 50.7 | 49.0 | 201.8 | 41.3 | 105.3 | 0.6 | 3.7 | 24.4 | 70.5 | 58.3 | 15.5 | 2.1 | 11.3 | 7.9 | 3.9 | 3.6 | 0.4 |
| 137344 | 81.7 | 278.2 | 80.0 | 44.1 | 42.9 | 194.0 | 37.3 | 108.4 | 0.5 | 3.7 | 18.8 | 67.1 | 49.9 | 11.5 | 3.4 | 12.2 | 8.9 | 4.4 | 3.4 | 0.4 |
| 156546 | 84.0 | 332.4 | 83.9 | 49.3 | 50.3 | 206.1 | 42.3 | 106.4 | 0.5 | 3.9 | 23.5 | 74.6 | 62.5 | 16.9 | 3.2 | 12.5 | 9.1 | 4.5 | 2.9 | 0.5 |
| 168367 | 84.7 | 292.9 | 65.2 | 55.2 | 49.5 | 201.1 | 38.7 | 108.3 | 0.5 | 3.8 | 21.0 | 74.9 | 53.3 | 15.9 | 2.6 | 10.8 | 8.7 | 4.0 | 4.5 | 0.5 |
| 158000 | 84.2 | 312.0 | 39.6 | 45.0 | 45.7 | 212.4 | 36.4 | 100.9 | 0.6 | 3.5 | 21.0 | 74.2 | 53.8 | 13.0 | 2.5 | 15.0 | 9.2 | 4.7 | 3.0 | 0.6 |
| 168108 | 85.8 | 330.6 | 30.0 | 49.7 | 50.8 | 202.1 | 39.6 | 98.8 | 0.5 | 3.7 | 21.0 | 72.2 | 52.6 | 12.2 | 2.4 | 9.2 | 9.1 | 4.3 | 3.3 | 0.6 |
| 150381 | 74.5 | 281.4 | 46.3 | 48.1 | 59.0 | 211.9 | 37.7 | 100.5 | 0.4 | 3.4 | 20.4 | 70.5 | 53.8 | 14.9 | 2.3 | 11.8 | 10.8 | 3.6 | 3.0 | 0.4 |
| 156547 | 88.7 | 273.5 | 28.2 | 41.2 | 49.2 | 196.5 | 37.1 | 90.9 | 0.3 | 3.5 | 21.1 | 66.2 | 55.8 | 12.1 | 2.3 | 11.8 | 7.5 | 4.0 | 4.6 | 0.7 |
| 156971 | 80.6 | 299.3 | <LOD | 47.2 | 52.8 | 190.6 | 37.9 | 93.8 | 0.5 | 2.8 | 20.3 | 68.5 | 52.0 | 13.6 | 2.0 | 9.2 | 8.1 | 4.0 | 2.5 | 0.3 |
| 152910 | 84.3 | 261.4 | 42.8 | 47.5 | 57.1 | 215.5 | 39.1 | 100.7 | 0.5 | 2.9 | 21.4 | 66.4 | 49.2 | 11.9 | 3.0 | 10.5 | 8.3 | 4.2 | 3.8 | 0.3 |
| 146975 | 78.3 | 310.5 | 43.9 | 47.0 | 46.5 | 189.5 | 41.2 | 91.6 | 0.4 | 2.6 | 19.4 | 61.5 | 54.8 | 12.8 | 2.2 | 11.1 | 8.2 | 3.7 | 2.9 | 0.3 |
| 157759 | 84.9 | 280.0 | 121.2 | 43.6 | 46.6 | 197.6 | 39.6 | 92.9 | 0.5 | 3.3 | 20.1 | 67.9 | 49.7 | 15.5 | 2.1 | 11.5 | 7.4 | 3.3 | 2.6 | 0.4 |
| 158733 | 88.4 | 295.3 | 157.0 | 48.0 | 45.0 | 208.7 | 36.6 | 91.7 | 0.4 | 3.7 | 21.5 | 62.8 | 50.4 | 12.3 | 3.2 | 10.2 | 6.8 | 4.1 | 4.6 | 0.6 |
| 151420 | 108.6 | 279.2 | 189.1 | 48.4 | 44.3 | 203.2 | 37.0 | 83.8 | 0.5 | 3.7 | 19.8 | 56.3 | 48.1 | 11.6 | 2.7 | 8.2 | 7.6 | 3.3 | 3.6 | 0.5 |
| 161382 | 107.5 | 277.6 | 230.0 | 49.8 | 56.5 | 207.8 | 33.2 | 86.8 | 0.3 | 2.7 | 16.5 | 59.3 | 52.6 | 8.9 | 2.5 | 9.9 | 8.0 | 2.9 | 2.7 | 0.3 |
| 143422 | 98.7 | 237.8 | 413.1 | 46.3 | 48.5 | 198.7 | 30.0 | 74.4 | 0.4 | 2.6 | 16.3 | 51.2 | 42.9 | 8.1 | 2.2 | 9.8 | 6.0 | 3.0 | 2.2 | 0.5 |
| 168150 | 111.6 | 239.5 | 403.4 | 49.3 | 72.7 | 203.8 | 29.8 | 75.7 | 0.4 | 3.0 | 15.2 | 51.0 | 41.4 | 12.2 | 2.4 | 8.7 | 6.0 | 3.7 | 3.0 | 0.6 |
| 171954 | 116.5 | 208.9 | 794.2 | 54.4 | 61.9 | 195.9 | 26.8 | 76.1 | 0.4 | 2.8 | 13.7 | 46.8 | 40.9 | 8.5 | 1.8 | 8.7 | 5.1 | 3.0 | 1.7 | 0.2 |
| 155671 | 130.7 | 226.4 | 787.3 | 43.7 | 62.1 | 193.2 | 26.3 | 74.6 | 0.4 | 3.1 | 13.2 | 41.5 | 32.0 | 10.9 | 1.5 | 7.8 | 5.5 | 1.8 | 2.1 | 0.5 |
| 158167 | 118.4 | 203.4 | 608.4 | 35.2 | 62.1 | 182.4 | 21.6 | 63.2 | 0.3 | 2.6 | 13.3 | 41.6 | 34.2 | 9.3 | 1.4 | 9.5 | 6.4 | 2.8 | 1.6 | 0.2 |
| 165685 | 125.5 | 179.6 | 739.9 | 45.7 | 39.4 | 192.6 | 23.8 | 58.5 | 0.4 | 3.4 | 10.4 | 35.6 | 31.1 | 8.3 | 2.2 | 8.7 | 2.7 | 1.3 | 1.7 | 0.2 |
| 170469 | 136.9 | 196.2 | 1204.9 | 45.6 | 40.1 | 194.9 | 21.0 | 65.4 | 0.5 | 2.6 | 11.4 | 38.2 | 28.7 | 6.8 | 1.8 | 6.3 | 4.0 | 2.7 | 1.4 | 0.4 |
| 171989 | 141.0 | 190.9 | 1012.1 | 39.8 | 62.0 | 190.5 | 18.7 | 59.3 | 0.3 | 2.5 | 10.7 | 30.4 | 25.0 | 10.0 | 1.3 | 4.9 | 4.8 | 1.2 | 2.3 | 0.2 |
| 159891 | 123.4 | 189.7 | 684.7 | 36.6 | 46.8 | 188.2 | 17.9 | 64.3 | 0.4 | 2.5 | 9.2 | 29.8 | 23.6 | 4.9 | 1.4 | 5.9 | 3.9 | 1.4 | 1.2 | 0.4 |
| 176375 | 125.5 | 153.1 | 959.4 | 42.3 | 66.3 | 194.2 | 18.4 | 58.1 | 0.4 | 2.8 | 8.0 | 33.2 | 25.9 | 7.6 | 1.6 | 5.5 | 5.4 | 1.5 | 2.0 | 0.3 |
| 157084 | 142.6 | 200.1 | 1020.6 | 36.8 | 57.7 | 191.6 | 18.6 | 60.2 | 0.4 | 3.1 | 8.6 | 28.1 | 26.7 | 6.2 | 1.5 | 6.2 | 2.7 | 1.9 | 1.0 | 0.3 |
| 158934 | 135.7 | 145.7 | 988.2 | 41.4 | 66.4 | 197.2 | 17.4 | 57.7 | 0.3 | 3.1 | 8.3 | 29.6 | 24.8 | 8.4 | 1.4 | 5.0 | 3.5 | 2.4 | 0.6 | 0.2 |
| 161885 | 141.2 | 149.6 | 827.2 | 38.6 | 57.2 | 201.4 | 18.3 | 53.6 | 0.4 | 3.0 | 9.1 | 28.4 | 20.3 | 4.4 | 1.6 | 7.4 | 4.2 | 1.6 | 0.9 | 0.1 |
| 167944 | 133.4 | 150.0 | 1281.0 | 40.5 | 51.4 | 191.3 | 16.6 | 56.6 | 0.4 | 2.4 | 8.6 | 26.6 | 24.6 | 6.7 | 1.2 | 6.5 | 3.6 | 2.2 | 1.1 | 0.2 |
| 156016 | 138.4 | 173.2 | 897.5 | 42.3 | 48.3 | 199.4 | 16.0 | 56.7 | 0.5 | 2.1 | 9.3 | 31.0 | 24.8 | 5.1 | 1.8 | 6.4 | 3.8 | 2.2 | 1.6 | 0.2 |
| 161997 | 136.6 | 178.1 | 1287.2 | 46.0 | 57.9 | 179.2 | 17.7 | 57.7 | 0.4 | 2.3 | 9.8 | 29.3 | 24.2 | 5.5 | 1.4 | 6.2 | 4.1 | 1.8 | 1.3 | 0.2 |
| 155267 | 129.5 | 144.7 | 1302.9 | 34.5 | 56.2 | 176.8 | 16.6 | 58.3 | 0.4 | 2.0 | 8.2 | 30.0 | 23.7 | 5.9 | 1.6 | 5.0 | 4.1 | 2.2 | 0.9 | 0.1 |
| 173542 | 145.7 | 166.9 | 939.4 | 42.3 | 60.7 | 201.3 | 16.8 | 56.8 | 0.4 | 2.6 | 9.4 | 32.8 | 31.4 | 8.1 | 1.4 | 5.5 | 3.8 | 2.1 | 2.3 | 0.1 |
| 155889 | 125.5 | 143.6 | 1044.8 | 44.5 | 54.0 | 179.8 | 17.8 | 52.0 | 0.4 | 2.3 | 9.6 | 31.1 | 28.5 | 6.2 | 1.4 | 5.6 | 3.1 | 2.2 | 1.7 | 0.3 |
| 154478 | 125.5 | 166.6 | 790.8 | 42.4 | 45.3 | 187.8 | 16.9 | 53.1 | 0.3 | 2.9 | 9.1 | 30.4 | 23.3 | 6.9 | 1.5 | 4.9 | 3.8 | 1.7 | 1.7 | 0.2 |
| 152012 | 115.5 | 178.5 | 763.0 | 36.4 | 65.9 | 164.0 | 16.7 | 53.4 | 0.2 | 2.8 | 8.5 | 30.8 | 20.7 | 6.1 | 1.0 | 5.6 | 3.7 | 2.8 | 1.1 | 0.4 |
| 146199 | 116.4 | 156.7 | 922.8 | 37.2 | 67.0 | 165.1 | 17.9 | 51.2 | 0.4 | 2.8 | 9.0 | 27.8 | 26.5 | 8.0 | 1.7 | 5.6 | 3.0 | 2.2 | 1.3 | 0.2 |
| 161558 | 118.2 | 146.7 | 617.6 | 31.7 | 44.7 | 157.4 | 16.9 | 50.4 | 0.3 | 2.0 | 9.1 | 28.7 | 21.2 | 6.7 | 1.4 | 4.8 | 5.1 | 1.4 | 1.7 | 0.2 |
| 183044 | 127.3 | 156.2 | 593.4 | 45.9 | 56.9 | 181.5 | 19.2 | 56.0 | 0.3 | 2.1 | 10.3 | 34.6 | 26.4 | 9.8 | 1.3 | 5.2 | 4.1 | 1.7 | 1.9 | 0.3 |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 164322 | 114.9 | 178.9 | 764.5 | 46.3 | 50.7 | 172.4 | 19.4 | 48.7 | 0.3 | 2.4 | 9.3 | 34.8 | 25.6 | 6.6 | 1.4 | 4.5 | 3.9 | 2.1 | 1.9 | 0.2 |
| 162575 | 113.1 | 169.8 | 342.5 | 45.9 | 67.8 | 169.7 | 20.2 | 52.2 | 0.2 | 2.4 | 9.9 | 36.8 | 30.0 | 9.0 | 1.8 | 7.0 | 5.0 | 1.7 | 1.4 | 0.3 |
| 146982 | 109.1 | 161.0 | 478.0 | 44.4 | 49.4 | 172.1 | 22.9 | 50.4 | 0.2 | 2.5 | 9.0 | 30.8 | 28.7 | 6.0 | 1.3 | 6.4 | 5.1 | 2.0 | 1.3 | 0.4 |
| 156905 | 111.0 | 176.5 | 467.1 | 45.7 | 87.3 | 175.4 | 23.4 | 53.2 | 0.3 | 2.5 | 11.3 | 38.1 | 31.6 | 7.1 | 2.1 | 6.7 | 5.2 | 2.5 | 1.7 | 0.3 |
| 145751 | 109.7 | 185.6 | 273.1 | 39.9 | 53.7 | 175.7 | 20.4 | 51.2 | 0.2 | 2.8 | 10.5 | 37.7 | 28.1 | 8.2 | 1.6 | 7.2 | 4.9 | 2.7 | 1.8 | 0.4 |
| 169697 | 100.9 | 167.8 | 402.1 | 37.3 | 60.1 | 167.8 | 22.9 | 55.0 | 0.3 | 2.0 | 10.6 | 37.7 | 29.3 | 6.8 | 1.3 | 7.1 | 5.1 | 2.6 | 3.2 | 0.3 |
| 145933 | 98.1 | 177.9 | 326.1 | 43.3 | 60.3 | 184.4 | 23.0 | 58.8 | 0.2 | 2.6 | 13.1 | 39.4 | 30.8 | 8.3 | 1.7 | 5.7 | 5.1 | 2.7 | 3.6 | 0.3 |
| 140911 | 92.3 | 218.9 | 253.1 | 42.3 | 58.1 | 186.0 | 21.4 | 57.8 | 0.3 | 2.2 | 12.6 | 39.9 | 35.8 | 9.4 | 1.7 | 7.1 | 5.3 | 1.6 | 2.6 | 0.3 |
| 178210 | 97.2 | 211.5 | 235.0 | 52.6 | 56.9 | 186.3 | 25.0 | 54.2 | 0.2 | 1.9 | 13.5 | 43.0 | 34.5 | 10.7 | 1.8 | 6.8 | 7.3 | 4.0 | 2.9 | 0.3 |
| 182647 | 97.0 | 209.6 | 310.9 | 45.7 | 57.2 | 192.6 | 26.4 | 58.3 | 0.3 | 1.9 | 14.0 | 41.7 | 38.6 | 9.0 | 1.9 | 7.8 | 6.1 | 2.8 | 2.6 | 0.5 |
| 146155 | 90.7 | 190.0 | 191.6 | 57.2 | 67.4 | 190.3 | 24.5 | 56.2 | 0.2 | 1.9 | 12.6 | 45.2 | 43.7 | 6.4 | 1.5 | 8.8 | 4.1 | 3.0 | 3.8 | 0.5 |
| 170743 | 89.9 | 209.6 | 264.5 | 42.9 | 54.2 | 194.0 | 26.5 | 62.4 | 0.3 | 2.1 | 13.2 | 43.7 | 36.3 | 8.5 | 2.1 | 6.9 | 6.0 | 2.9 | 1.9 | 0.2 |
| 151481 | 87.2 | 221.8 | 162.5 | 45.0 | 58.9 | 175.3 | 26.1 | 59.5 | 0.2 | 2.1 | 13.8 | 43.6 | 36.0 | 8.8 | 2.4 | 8.8 | 5.5 | 2.6 | 2.4 | 0.2 |
| 162155 | 95.0 | 238.8 | 199.4 | 48.4 | 54.9 | 209.0 | 28.7 | 62.3 | 0.2 | 2.0 | 15.0 | 51.6 | 42.3 | 10.3 | 1.4 | 9.3 | 5.9 | 3.9 | 3.4 | 0.4 |
| 151702 | 81.1 | 211.8 | 130.9 | 40.6 | 56.7 | 200.6 | 29.7 | 64.9 | 0.3 | 1.9 | 15.8 | 48.6 | 39.4 | 8.2 | 1.9 | 8.9 | 7.3 | 2.9 | 3.1 | 0.3 |
| 147459 | 92.1 | 225.5 | 245.7 | 41.1 | 66.6 | 192.2 | 29.1 | 58.8 | 0.3 | 2.0 | 14.0 | 50.6 | 35.9 | 9.9 | 1.8 | 9.8 | 6.3 | 2.3 | 3.0 | 0.6 |
| 143987 | 82.6 | 222.0 | 223.1 | 40.4 | 50.6 | 195.3 | 31.1 | 65.1 | 0.3 | 2.0 | 15.5 | 51.9 | 33.2 | 12.3 | 2.0 | 7.9 | 6.5 | 2.3 | 2.6 | 0.2 |
| 145900 | 83.0 | 203.7 | 165.2 | 41.1 | 72.6 | 197.0 | 27.5 | 61.2 | 0.2 | 2.4 | 14.1 | 48.1 | 35.2 | 11.2 | 2.1 | 8.9 | 5.8 | 2.1 | 1.8 | 0.4 |
| 154103 | 80.1 | 231.2 | 171.5 | 43.0 | 44.7 | 188.9 | 32.3 | 69.7 | 0.3 | 1.9 | 16.1 | 49.1 | 38.0 | 10.6 | 1.6 | 6.9 | 7.7 | 3.5 | 1.8 | 0.4 |
| 144508 | 87.9 | 259.3 | 138.7 | 45.2 | 47.9 | 222.8 | 29.2 | 81.9 | 0.3 | 1.9 | 14.6 | 52.4 | 44.3 | 11.4 | 2.2 | 7.9 | 7.9 | 3.6 | 2.9 | 0.6 |
| 176418 | 92.4 | 271.1 | 144.3 | 47.5 | 59.5 | 216.6 | 30.7 | 79.0 | 0.3 | 2.0 | 17.4 | 54.2 | 43.4 | 8.3 | 1.9 | 11.2 | 7.5 | 3.6 | 2.9 | 0.6 |
| 163970 | 74.6 | 241.7 | 115.4 | 42.1 | 62.1 | 214.6 | 32.3 | 65.9 | 0.2 | 1.7 | 17.2 | 54.9 | 43.6 | 11.7 | 2.2 | 9.7 | 4.6 | 2.3 | 1.8 | 0.4 |
| 151955 | 85.0 | 251.6 | 126.9 | 49.5 | 57.9 | 206.3 | 28.9 | 74.8 | 0.3 | 1.8 | 15.8 | 50.0 | 33.0 | 9.1 | 2.3 | 7.8 | 5.6 | 3.9 | 2.5 | 0.4 |
| 175950 | 88.0 | 238.9 | 112.0 | 48.8 | 62.9 | 203.5 | 32.9 | 84.6 | 0.2 | 1.8 | 17.4 | 59.4 | 38.9 | 11.2 | 1.3 | 10.1 | 7.1 | 3.4 | 4.2 | 0.3 |
| 166574 | 94.0 | 240.1 | 132.0 | 49.3 | 72.6 | 210.4 | 30.5 | 70.2 | 0.2 | 1.7 | 15.8 | 53.0 | 42.8 | 11.0 | 2.3 | 10.5 | 6.8 | 3.4 | 3.6 | 0.5 |
| 148940 | 73.3 | 240.3 | 116.9 | 52.3 | 53.7 | 199.7 | 27.3 | 74.5 | 0.3 | 1.6 | 16.3 | 51.5 | 45.0 | 9.9 | 2.2 | 9.8 | 6.8 | 2.0 | 3.1 | 0.5 |
| 139079 | 79.1 | 236.1 | 147.8 | 46.2 | 54.1 | 182.2 | 28.0 | 65.9 | 0.3 | 1.6 | 15.0 | 49.4 | 37.2 | 11.0 | 2.1 | 8.5 | 7.2 | 3.6 | 3.0 | 0.2 |
| 144043 | 72.1 | 236.8 | 80.4 | 39.0 | 65.4 | 198.2 | 29.6 | 67.1 | 0.3 | 1.5 | 13.9 | 52.2 | 43.7 | 10.1 | 1.8 | 10.1 | 6.3 | 2.0 | 3.1 | 0.2 |
| 149796 | 78.9 | 217.6 | 107.3 | 54.2 | 59.0 | 185.9 | 32.4 | 69.4 | 0.4 | 1.8 | 14.2 | 46.7 | 37.5 | 12.5 | 2.4 | 10.1 | 8.3 | 2.5 | 1.9 | 0.4 |
| 151686 | 77.1 | 229.4 | 156.6 | 45.9 | 58.1 | 189.4 | 30.3 | 75.3 | 0.3 | 1.6 | 14.8 | 52.8 | 45.4 | 12.0 | 2.1 | 7.9 | 6.1 | 2.7 | 3.0 | 0.2 |
| 177844 | 86.2 | 273.7 | 86.6 | 49.6 | 67.2 | 196.1 | 32.5 | 81.4 | 0.3 | 1.8 | 15.7 | 56.9 | 52.6 | 11.9 | 3.0 | 9.1 | 6.8 | 3.6 | 3.3 | 0.4 |
| 156685 | 78.2 | 237.8 | 136.2 | 48.5 | 59.2 | 205.9 | 29.4 | 68.6 | 0.4 | 2.0 | 16.0 | 53.0 | 45.9 | 13.2 | 2.2 | 8.2 | 8.8 | 2.6 | 2.3 | 0.6 |
| 152691 | 74.4 | 237.7 | 54.5 | 41.2 | 60.7 | 189.8 | 26.5 | 65.2 | 0.2 | 1.4 | 13.6 | 49.2 | 40.7 | 8.0 | 2.2 | 8.2 | 6.1 | 3.6 | 3.0 | 0.3 |
| 151012 | 84.6 | 261.0 | 113.3 | 43.5 | 50.2 | 206.3 | 29.8 | 71.8 | 0.3 | 1.7 | 15.3 | 53.7 | 38.2 | 11.8 | 1.7 | 7.3 | 7.1 | 2.8 | 2.4 | 0.4 |
| 156576 | 81.9 | 245.1 | 79.1 | 45.0 | 49.6 | 198.9 | 32.0 | 72.6 | 0.4 | 1.2 | 17.4 | 54.7 | 42.5 | 10.7 | 1.4 | 10.2 | 8.4 | 3.6 | 2.7 | 0.3 |
| 156108 | 72.1 | 235.5 | 102.4 | 48.0 | 51.9 | 192.2 | 30.1 | 75.3 | 0.3 | 1.2 | 16.9 | 50.3 | 33.6 | 11.3 | 1.5 | 10.8 | 6.8 | 2.2 | 2.2 | 0.4 |
| 164014 | 78.6 | 246.2 | 117.4 | 51.5 | 52.5 | 194.8 | 32.8 | 78.5 | 0.4 | 1.4 | 18.0 | 57.9 | 40.5 | 10.5 | 2.1 | 9.3 | 7.1 | 2.4 | 4.6 | 0.3 |
| 145401 | 69.3 | 232.0 | 84.2 | 38.9 | 50.9 | 197.2 | 32.1 | 73.6 | 0.4 | 1.5 | 16.5 | 54.1 | 51.8 | 9.5 | 2.4 | 9.6 | 6.6 | 3.3 | 3.4 | 0.4 |
| 158500 | 71.7 | 272.2 | 48.9 | 48.2 | 43.6 | 205.6 | 33.5 | 69.9 | 0.3 | 1.7 | 17.9 | 60.0 | 48.0 | 11.9 | 2.6 | 8.5 | 7.8 | 5.0 | 3.3 | 0.6 |
| 146784 | 79.7 | 260.5 | 60.5 | 54.0 | 54.4 | 212.2 | 29.9 | 97.3 | 0.4 | 1.6 | 18.0 | 60.9 | 46.1 | 10.7 | 2.1 | 10.5 | 9.0 | 4.0 | 2.4 | 0.3 |
| 153540 | 70.1 | 245.7 | 46.4 | 40.1 | 62.9 | 198.8 | 33.0 | 78.9 | 0.5 | 1.4 | 18.7 | 55.0 | 45.7 | 11.0 | 1.8 | 8.6 | 7.0 | 2.5 | 3.1 | 0.4 |
| 157589 | 77.4 | 280.2 | 46.5 | 47.8 | 46.7 | 193.8 | 31.3 | 75.5 | 0.6 | 1.5 | 18.9 | 55.7 | 49.4 | 11.2 | 2.3 | 10.0 | 9.0 | 2.9 | 3.3 | 0.3 |
| 158141 | 74.6 | 267.1 | 45.5 | 47.2 | 53.4 | 197.8 | 34.0 | 74.8 | 0.3 | 1.0 | 18.3 | 55.9 | 40.0 | 12.8 | 2.1 | 8.2 | 6.3 | 2.6 | 3.7 | 0.4 |
| 165297 | 80.0 | 296.0 | 49.8 | 51.6 | 59.1 | 212.4 | 36.8 | 89.1 | 0.2 | 1.1 | 18.0 | 63.4 | 49.0 | 11.8 | 2.3 | 8.9 | 7.9 | 3.7 | 4.0 | 0.4 |
| 141315 | 66.7 | 266.9 | 43.8 | 43.0 | 70.8 | 196.4 | 30.4 | 74.4 | 0.4 | 1.4 | 17.3 | 55.3 | 37.3 | 11.0 | 2.4 | 9.1 | 7.7 | 2.5 | 3.2 | 0.4 |
| 150803 | 76.3 | 274.5 | 52.9 | 44.1 | 42.9 | 207.2 | 34.3 | 82.8 | 0.3 | 1.5 | 17.0 | 58.8 | 47.2 | 13.0 | 2.6 | 8.9 | 8.4 | 3.7 | 3.3 | 0.7 |
| 158047 | 89.5 | 257.9 | 60.6 | 48.4 | 67.9 | 200.3 | 37.0 | 79.4 | 0.4 | 1.6 | 17.0 | 59.5 | 51.7 | 10.6 | 2.6 | 10.2 | 7.1 | 3.4 | 3.0 | 0.6 |
| 167204 | 76.4 | 297.4 | 74.6 | 46.4 | 63.9 | 202.2 | 32.0 | 82.8 | 0.3 | 1.5 | 16.9 | 55.3 | 42.3 | 12.5 | 2.5 | 10.0 | 6.8 | 3.0 | 3.7 | 0.3 |
| 167443 | 86.1 | 300.1 | 88.1 | 53.1 | 87.6 | 217.4 | 35.6 | 79.1 | 0.4 | 1.3 | 19.1 | 54.5 | 38.4 | 12.4 | 3.2 | 11.0 | 7.2 | 3.1 | 3.2 | 0.4 |
| 164493 | 79.0 | 276.0 | 85.1 | 45.2 | 53.6 | 196.8 | 33.2 | 79.1 | 0.3 | 1.0 | 16.4 | 55.6 | 50.8 | 11.4 | 2.7 | 9.2 | 6.3 | 2.5 | 2.5 | 0.3 |
| 149715 | 75.7 | 266.9 | 97.4 | 48.1 | 54.4 | 201.9 | 29.2 | 73.8 | 0.5 | 1.2 | 14.6 | 48.8 | 49.1 | 8.5 | 2.4 | 9.5 | 4.4 | 3.0 | 2.8 | 0.4 |
| 149557 | 85.0 | 275.1 | 78.7 | 46.1 | 73.1 | 189.2 | 32.0 | 70.0 | 0.3 | 0.9 | 15.5 | 50.1 | 42.6 | 10.1 | 1.6 | 9.0 | 7.6 | 2.2 | 2.8 | 0.3 |
| 151215 | 72.6 | 247.9 | 102.7 | 49.2 | 56.4 | 189.9 | 28.4 | 70.9 | 0.3 | 1.1 | 16.4 | 55.0 | 39.8 | 11.3 | 2.0 | 8.5 | 6.1 | 2.6 | 4.1 | 0.3 |
| 162005 | 87.0 | 272.2 | 150.2 | 46.3 | 63.6 | 199.8 | 28.1 | 81.0 | 0.3 | 1.2 | 15.1 | 54.9 | 35.7 | 11.0 | 2.1 | 10.8 | 9.8 | 3.5 | 2.7 | 0.4 |
| 167998 | 81.2 | 263.6 | 109.7 | 38.9 | 74.3 | 197.3 | 28.3 | 74.7 | 0.2 | 1.0 | 16.2 | 54.5 | 36.6 | 12.8 | 2.2 | 9.6 | 7.5 | 2.8 | 2.5 | 0.4 |
| 165298 | 76.8 | 238.5 | 152.5 | 48.4 | 55.9 | 181.8 | 29.3 | 62.7 | 0.3 | 1.0 | 14.3 | 48.7 | 35.3 | 13.7 | 2.1 | 8.5 | 5.0 | 2.7 | 2.4 | 0.5 |
| 152618 | 88.3 | 240.7 | 130.9 | 46.1 | 53.7 | 191.0 | 29.2 | 60.0 | 0.3 | 1.1 | 15.7 | 47.8 | 36.6 | 9.1 | 2.1 | 7.4 | 5.7 | 3.0 | 2.1 | 0.3 |
| 148163 | 80.7 | 204.8 | 242.0 | 42.8 | 70.7 | 179.2 | 28.1 | 65.5 | 0.2 | 1.1 | 12.7 | 44.1 | 39.5 | 8.8 | 2.0 | 8.3 | 5.6 | 2.2 | 2.2 | 0.2 |
| 162161 | 88.3 | 215.3 | 312.4 | 45.9 | 70.4 | 176.1 | 27.2 | 60.4 | 0.3 | 0.8 | 13.4 | 46.4 | 33.6 | 10.1 | 2.1 | 9.1 | 5.3 | 2.7 | 2.7 | 0.2 |
| 170409 | 89.4 | 218.6 | 151.0 | 41.7 | 59.1 | 169.7 | 28.8 | 57.9 | 0.2 | 0.7 | 14.6 | 46.5 | 35.7 | 9.3 | 1.8 | 9.1 | 5.6 | 2.7 | 2.6 | 0.3 |
| 177911 | 101.9 | 218.4 | 262.1 | 52.1 | 67.9 | 191.8 | 28.1 | 66.0 | 0.3 | 0.6 | 15.3 | 48.5 | 38.2 | 11.5 | 2.1 | 8.7 | 6.0 | 3.4 | 3.1 | 0.4 |
| 152173 | 101.2 | 234.0 | 317.0 | 47.6 | 58.9 | 197.6 | 28.3 | 63.2 | 0.3 | 1.0 | 13.8 | 43.9 | 34.2 | 9.9 | 1.4 | 8.3 | 5.1 | 2.8 | 2.2 | 0.4 |
| 154304 | 106.3 | 212.9 | 334.5 | 40.0 | 69.2 | 198.9 | 28.4 | 64.1 | 0.3 | 0.9 | 11.8 | 44.2 | 33.6 | 10.3 | 2.7 | 10.3 | 6.9 | 2.0 | 1.7 | 0.4 |
| 152716 | 108.1 | 212.8 | 342.4 | 44.0 | 56.9 | 176.9 | 26.2 | 63.3 | 0.4 | 0.7 | 13.5 | 41.5 | 35.1 | 8.7 | 1.6 | 7.3 | 5.2 | 3.7 | 2.5 | 0.2 |
| 148172 | 95.9 | 207.8 | 309.5 | 44.4 | 56.3 | 185.0 | 23.2 | 64.8 | 0.3 | 0.9 | 13.2 | 41.8 | 32.4 | 6.8 | 2.4 | 8.4 | 6.0 | 2.7 | 2.3 | 0.4 |
| 156961 | 110.4 | 215.3 | 450.3 | 39.8 | 51.5 | 196.6 | 25.1 | 56.2 | 0.3 | 0.8 | 12.0 | 40.5 | 33.1 | 10.1 | 2.2 | 8.9 | 5.3 | 2.6 | 2.7 | 0.3 |
| 160920 | 110.2 | 213.9 | 357.2 | 42.4 | 51.3 | 185.5 | 22.8 | 58.8 | 0.3 | 0.7 | 12.1 | 35.5 | 41.4 | 7.3 | 2.0 | 7.1 | 5.3 | 1.7 | 3.1 | 0.3 |
| 161745 | 101.9 | 185.3 | 594.4 | 44.3 | 62.4 | 178.8 | 22.0 | 61.3 | 0.3 | 0.6 | 13.1 | 42.7 | 34.6 | 7.3 | 1.8 | 7.4 | 3.8 | 1.8 | 2.0 | 0.2 |
| 158094 | 107.3 | 193.5 | 470.3 | 47.0 | 56.7 | 174.1 | 23.0 | 58.2 | 0.2 | 0.7 | 12.1 | 36.4 | 29.4 | 10.4 | 1.5 | 7.5 | 6.0 | 1.9 | 1.6 | 0.3 |
| 156785 | 105.4 | 164.0 | 687.6 | 37.1 | 50.9 | 180.1 | 22.3 | 54.1 | 0.3 | 0.6 | 10.0 | 38.7 | 26.4 | 7.2 | 1.7 | 5.5 | 3.7 | 1.7 | 2.3 | 0.2 |
| 157361 | 102.5 | 172.6 | 490.4 | 41.4 | 62.6 | 188.8 | 18.5 | 57.4 | 0.3 | 0.5 | 12.3 | 35.9 | 25.5 | 6.8 | 1.5 | 5.5 | 3.7 | 2.5 | 2.6 | 0.2 |
| 155862 | 116.2 | 160.1 | 540.0 | 40.2 | 51.9 | 184.9 | 21.1 | 66.4 | 0.4 | 0.4 | 10.9 | 35.5 | 26.9 | 7.3 | 2.1 | 6.9 | 6.0 | 1.9 | 1.5 | 0.4 |
| 176921 | 119.1 | 182.0 | 656.5 | 39.4 | 60.7 | 185.1 | 21.2 | 63.0 | 0.3 | 0.7 | 10.9 | 31.6 | 27.4 | 7.5 | 1.5 | 6.9 | 5.5 | 1.7 | 2.4 | 0.3 |
| 172125 | 129.8 | 154.7 | 770.3 | 44.4 | 45.8 | 183.9 | 20.5 | 60.2 | 0.3 | 0.6 | 10.4 | 32.5 | 28.8 | 7.4 | 1.6 | 6.7 | 5.0 | 2.2 | 1.8 | 0.1 |
| 159944 | 126.3 | 170.0 | 709.1 | 45.7 | 58.7 | 172.7 | 20.5 | 64.8 | 0.4 | 0.6 | 10.0 | 31.6 | 32.8 | 6.7 | 1.9 | 6.6 | 3.7 | 1.3 | 1.7 | 0.2 |
| 158250 | 124.6 | 157.8 | 831.1 | 40.4 | 53.0 | 163.8 | 19.0 | 53.3 | 0.4 | 0.4 | 9.3 | 32.0 | 31.5 | 7.5 | 1.7 | 6.5 | 4.0 | 2.3 | 2.2 | 0.2 |
| 183105 | 143.2 | 173.7 | 1178.1 | 41.5 | 52.9 | 189.3 | 22.1 | 67.0 | 0.3 | 0.4 | 10.7 | 35.6 | 22.7 | 8.8 | 1.6 | 6.8 | 2.5 | 2.2 | 2.3 | 0.2 |
| 164302 | 127.1 | 174.5 | 755.1 | 39.8 | 50.5 | 185.2 | 19.0 | 58.3 | 0.3 | 0.6 | 9.5 | 29.8 | 30.3 | 6.6 | 1.7 | 6.2 | 3.5 | 2.5 | 1.5 | 0.3 |
| 177082 | 148.5 | 204.2 | 1089.1 | 44.6 | 63.3 | 186.3 | 21.2 | 60.8 | 0.3 | 0.5 | 11.5 | 28.0 | 29.3 | 6.4 | 1.5 | 5.8 | 3.9 | 2.2 | 1.9 | 0.3 |
| 145715 | 125.6 | 159.7 | 668.7 | 38.1 | 50.0 | 164.6 | 17.5 | 53.1 | 0.3 | 0.4 | 8.5 | 29.9 | 24.4 | 5.7 | 1.5 | 6.4 | 3.5 | 1.9 | 1.6 | 0.3 |
| 165820 | 129.9 | 158.8 | 937.8 | 40.4 | 59.6 | 162.7 | 16.6 | 52.1 | 0.4 | 0.6 | 7.6 | 27.4 | 22.6 | 4.8 | 1.5 | 5.6 | 3.3 | 2.1 | 2.0 | 0.2 |
| 149532 | 140.0 | 155.4 | 1066.2 | 35.8 | 41.9 | 163.5 | 18.3 | 52.0 | 0.2 | 0.4 | 8.0 | 31.3 | 19.8 | 5.5 | 1.3 | 6.3 | 5.3 | 2.3 | 1.4 | 0.2 |
| 147593 | 127.5 | 151.3 | 946.7 | 47.2 | 41.2 | 170.7 | 16.1 | 55.8 | 0.4 | 0.5 | 8.5 | 28.5 | 22.5 | 7.2 | 1.1 | 6.6 | 3.6 | 1.6 | 2.3 | 0.2 |
| 157424 | 141.8 | 159.4 | 1277.2 | 42.5 | 64.0 | 174.8 | 18.8 | 63.8 | 0.6 | 0.5 | 8.3 | 29.1 | 23.0 | 5.9 | 1.7 | 6.4 | 4.0 | 1.5 | 1.1 | 0.2 |
| 158974 | 133.1 | 177.7 | 1044.4 | 48.2 | 58.8 | 176.4 | 15.9 | 60.0 | 0.5 | 0.6 | 8.3 | 27.1 | 28.5 | 6.9 | 1.8 | 7.0 | 4.5 | 1.8 | 1.2 | <LOD |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 164121 | 141.4 | 204.3 | 1071.8 | 41.3 | 69.9 | 176.1 | 20.1 | 60.9 | 0.4 | 0.5 | 11.3 | 30.8 | 26.4 | 6.6 | 1.2 | 5.8 | 4.1 | 0.9 | 1.0 | 0.3 |
| 150629 | 127.8 | 164.3 | 948.3 | 40.0 | 39.8 | 176.6 | 17.9 | 60.2 | 0.4 | 0.4 | 8.8 | 32.7 | 29.7 | 6.2 | 1.5 | 5.1 | 4.8 | 1.7 | 1.3 | 0.2 |
| 173113 | 153.7 | 180.7 | 1048.1 | 37.9 | 53.7 | 180.5 | 19.2 | 64.5 | 0.3 | 0.5 | 9.6 | 33.8 | 23.0 | 10.5 | 1.7 | 7.4 | 6.1 | 1.8 | 1.6 | 0.4 |
| 175584 | 135.8 | 196.7 | 876.7 | 33.6 | 61.1 | 190.7 | 20.7 | 61.6 | 0.4 | 0.4 | 11.9 | 35.0 | 32.6 | 9.1 | 1.4 | 5.2 | 5.3 | 2.4 | 1.0 | 0.3 |
| 176425 | 131.2 | 214.9 | 799.4 | 43.7 | 65.4 | 178.4 | 24.0 | 69.9 | 0.5 | 0.6 | 12.1 | 43.5 | 31.8 | 8.7 | 2.3 | 8.3 | 7.1 | 2.3 | 2.7 | 0.3 |
| 150480 | 116.0 | 201.1 | 658.7 | 40.3 | 40.6 | 170.5 | 23.8 | 65.7 | 0.3 | 0.4 | 12.2 | 40.9 | 33.6 | 8.3 | 1.8 | 9.5 | 5.8 | 3.1 | 1.5 | 0.3 |
| 155239 | 123.9 | 240.1 | 615.1 | 40.8 | 50.5 | 176.1 | 25.8 | 76.1 | 0.3 | 0.5 | 14.4 | 44.5 | 31.3 | 9.4 | 2.3 | 7.2 | 6.4 | 3.1 | 2.9 | 0.2 |
| 152173 | 110.7 | 230.6 | 491.0 | 37.6 | 55.1 | 185.1 | 26.7 | 76.5 | 0.5 | 0.6 | 14.5 | 48.2 | 34.8 | 8.1 | 1.8 | 6.9 | 7.8 | 3.0 | 2.9 | 0.5 |
| 156912 | 98.3 | 226.2 | 356.4 | 43.2 | 50.0 | 179.9 | 29.5 | 80.5 | 0.5 | 0.5 | 15.8 | 51.0 | 31.3 | 11.3 | 1.5 | 7.9 | 7.7 | 3.0 | 2.9 | 0.3 |
| 150559 | 96.1 | 251.4 | 434.7 | 45.5 | 45.9 | 193.4 | 31.3 | 81.5 | 0.7 | 0.6 | 17.6 | 55.5 | 45.8 | 13.0 | 2.0 | 11.0 | 7.4 | 2.5 | 4.5 | 0.4 |
| 153955 | 92.0 | 257.0 | 241.6 | 49.9 | 46.7 | 203.0 | 34.0 | 92.8 | 0.7 | 0.5 | 17.7 | 56.8 | 48.5 | 13.2 | 2.4 | 9.9 | 7.2 | 3.3 | 4.0 | 0.3 |
| 175329 | 91.8 | 300.7 | 234.7 | 50.0 | 46.5 | 205.2 | 35.3 | 105.3 | 0.9 | 0.7 | 19.0 | 67.1 | 41.9 | 14.8 | 2.5 | 10.5 | 8.3 | 4.3 | 2.8 | 0.5 |
| 160613 | 93.5 | 326.0 | 148.6 | 54.9 | 50.5 | 214.8 | 38.4 | 101.9 | 0.6 | 0.7 | 22.2 | 66.6 | 50.0 | 16.8 | 3.0 | 9.3 | 10.0 | 3.2 | 3.1 | 0.7 |
| 163847 | 75.2 | 315.5 | 88.9 | 52.0 | 37.7 | 192.7 | 36.2 | 94.2 | 0.7 | 0.8 | 18.0 | 57.3 | 45.5 | 13.2 | 2.7 | 9.4 | 7.6 | 3.0 | 3.9 | 0.6 |
| 163028 | 74.0 | 293.0 | 38.7 | 39.8 | 64.8 | 201.1 | 36.0 | 92.8 | 0.5 | 0.6 | 19.0 | 61.5 | 47.8 | 11.1 | 2.3 | 10.4 | 7.3 | 3.5 | 2.3 | 0.4 |
| 160241 | 76.9 | 283.3 | 34.4 | 44.1 | 50.1 | 210.3 | 34.6 | 92.3 | 0.8 | 0.8 | 19.9 | 62.1 | 49.6 | 11.2 | 2.8 | 9.9 | 4.9 | 3.7 | 2.6 | 0.4 |
| 153843 | 81.9 | 307.2 | 67.4 | 49.1 | 54.6 | 200.4 | 35.6 | 98.3 | 0.7 | 0.4 | 18.1 | 58.4 | 51.3 | 15.7 | 2.4 | 11.7 | 7.8 | 3.9 | 2.9 | 0.5 |
| 165122 | 77.8 | 287.4 | 164.6 | 43.1 | 60.2 | 204.1 | 32.5 | 84.7 | 0.7 | 0.5 | 16.7 | 57.1 | 47.8 | 11.2 | 2.6 | 9.6 | 6.8 | 3.2 | 2.1 | 0.3 |
| 154819 | 94.4 | 328.7 | 206.2 | 45.6 | 60.4 | 210.5 | 33.2 | 86.6 | 0.6 | 0.7 | 19.2 | 54.8 | 43.6 | 10.3 | 2.6 | 8.5 | 7.5 | 3.3 | 2.4 | 0.4 |
| 135448 | 79.0 | 251.1 | 249.3 | 46.4 | 63.8 | 207.1 | 30.3 | 74.6 | 0.6 | 0.5 | 13.9 | 50.8 | 37.6 | 11.3 | 2.2 | 10.7 | 3.6 | 2.1 | 1.8 | 0.3 |
| 138126 | 75.9 | 246.2 | 420.5 | 41.1 | 80.7 | 185.6 | 26.6 | 71.7 | 0.3 | 0.5 | 13.3 | 40.4 | 33.4 | 6.2 | 1.7 | 6.5 | 6.0 | 2.9 | 1.2 | 0.3 |
| 150792 | 83.2 | 207.3 | 497.4 | 41.2 | 63.6 | 195.6 | 26.2 | 62.9 | 0.4 | 0.4 | 13.7 | 39.4 | 35.4 | 7.3 | 1.5 | 8.8 | 6.0 | 2.4 | 1.9 | 0.4 |
| 161048 | 84.7 | 187.4 | 522.9 | 37.3 | 70.2 | 180.6 | 22.0 | 57.4 | 0.4 | 0.5 | 12.1 | 42.0 | 32.7 | 8.0 | 1.7 | 8.1 | 4.2 | 1.7 | 1.8 | 0.3 |
| 170835 | 86.0 | 168.9 | 528.8 | 40.4 | 84.7 | 187.9 | 21.4 | 51.9 | 0.3 | 0.5 | 12.1 | 34.3 | 31.9 | 5.4 | 1.5 | 6.5 | 5.4 | 2.6 | 2.0 | 0.2 |
| 139610 | 88.2 | 168.4 | 754.9 | 35.5 | 93.2 | 175.7 | 18.2 | 48.9 | 0.3 | 0.2 | 8.9 | 31.9 | 23.5 | 5.3 | 1.8 | 6.6 | 3.8 | 2.2 | 2.3 | 0.2 |
| 157305 | 81.2 | 168.1 | 691.9 | 43.1 | 103.8 | 184.4 | 16.2 | 42.0 | 0.3 | 0.2 | 9.7 | 28.7 | 25.6 | 6.2 | 0.7 | 4.9 | 2.8 | 2.1 | 2.6 | 0.2 |
| 166015 | 94.9 | 139.5 | 670.4 | 37.3 | 109.9 | 175.6 | 15.9 | 48.3 | 0.3 | 0.2 | 9.1 | 25.2 | 24.0 | 5.7 | 1.5 | 4.2 | 3.9 | 1.1 | 1.7 | 0.2 |
| 156864 | 98.6 | 145.2 | 1041.9 | 39.2 | 130.7 | 197.2 | 14.2 | 36.9 | 0.2 | 0.4 | 8.6 | 26.8 | 21.9 | 4.7 | 1.1 | 4.7 | 3.1 | 1.7 | 0.9 | 0.3 |
| 173563 | 93.2 | 138.0 | 866.4 | 36.8 | 78.5 | 194.3 | 16.0 | 39.7 | 0.2 | 0.2 | 7.4 | 26.6 | 21.0 | 4.1 | 1.2 | 4.9 | 3.8 | 2.0 | 1.7 | 0.1 |
| 170784 | 95.6 | 153.1 | 1173.4 | 42.7 | 110.3 | 180.5 | 15.2 | 38.0 | 0.3 | 0.3 | 10.2 | 28.0 | 22.5 | 6.0 | 1.8 | 5.1 | 2.7 | 2.0 | 2.2 | 0.2 |
| 158421 | 98.8 | 155.0 | 943.2 | 39.3 | 80.7 | 202.8 | 15.3 | 44.1 | 0.2 | 0.2 | 9.5 | 29.5 | 24.6 | 7.4 | 1.2 | 4.9 | 3.0 | 1.5 | 1.6 | 0.2 |
| 158645 | 101.1 | 163.1 | 776.1 | 46.3 | 84.6 | 185.2 | 15.4 | 41.1 | 0.2 | 0.4 | 8.7 | 29.3 | 22.1 | 5.5 | 1.8 | 5.7 | 4.3 | 1.1 | 1.0 | 0.1 |
| 152084 | 89.7 | 163.7 | 740.3 | 39.0 | 80.8 | 191.0 | 17.4 | 46.5 | 0.2 | 0.3 | 9.2 | 30.8 | 23.2 | 7.9 | 1.2 | 5.7 | 3.6 | 2.3 | 1.9 | 0.3 |
| 149599 | 97.4 | 147.8 | 503.2 | 37.8 | 91.8 | 189.7 | 19.3 | 52.8 | 0.2 | 0.4 | 11.2 | 31.5 | 25.1 | 7.6 | 1.8 | 7.0 | 5.2 | 2.1 | 2.3 | 0.2 |
| 157672 | 91.4 | 155.8 | 575.2 | 43.8 | 103.2 | 207.5 | 21.7 | 53.3 | 0.3 | 0.4 | 11.4 | 35.9 | 27.0 | 5.9 | 1.3 | 6.8 | 5.5 | 2.3 | 1.4 | 0.3 |
| 165708 | 98.7 | 190.3 | 465.5 | 37.8 | 72.2 | 202.5 | 22.2 | 57.6 | 0.4 | 0.3 | 11.5 | 40.2 | 32.6 | 9.4 | 2.1 | 6.9 | 6.2 | 2.5 | 2.3 | 0.4 |
| 172952 | 89.2 | 175.6 | 482.4 | 48.5 | 75.5 | 203.2 | 26.7 | 71.1 | 0.4 | 0.3 | 12.4 | 48.0 | 35.0 | 9.7 | 2.4 | 9.3 | 5.3 | 2.7 | 2.9 | 0.4 |
| 176411 | 88.9 | 222.4 | 241.0 | 48.1 | 70.1 | 199.9 | 28.0 | 67.2 | 0.4 | 0.2 | 14.6 | 47.8 | 39.0 | 13.1 | 2.1 | 9.0 | 8.1 | 3.3 | 3.4 | 0.4 |
| 163795 | 84.0 | 245.4 | 258.7 | 50.6 | 83.6 | 194.3 | 34.7 | 60.5 | 0.4 | 0.4 | 15.6 | 50.8 | 39.6 | 13.8 | 1.9 | 11.6 | 6.8 | 3.7 | 3.4 | 0.5 |
| 153471 | 84.2 | 218.0 | 125.5 | 43.2 | 60.1 | 195.3 | 37.0 | 76.2 | 0.5 | 0.8 | 21.6 | 65.0 | 51.1 | 14.9 | 2.0 | 10.4 | 7.8 | 3.0 | 1.5 | 0.7 |
| 154638 | 71.3 | 276.1 | 92.8 | 49.5 | 49.9 | 178.4 | 42.7 | 83.5 | 0.6 | 1.7 | 25.3 | 77.1 | 61.5 | 16.2 | 2.2 | 9.8 | 10.2 | 4.8 | 5.5 | 0.4 |
| 166737 | 86.3 | 262.0 | 87.6 | 48.4 | 77.4 | 194.4 | 50.7 | 95.8 | 1.1 | 3.1 | 36.6 | 98.5 | 74.8 | 14.3 | 2.2 | 15.6 | 10.6 | 6.3 | 4.4 | 0.6 |
| 166184 | 72.9 | 238.9 | 53.5 | 46.0 | 50.4 | 183.1 | 51.9 | 92.8 | 2.1 | 4.7 | 43.5 | 113.7 | 80.6 | 17.9 | 2.7 | 15.2 | 13.7 | 6.2 | 5.7 | 0.5 |
| 155681 | 71.8 | 262.3 | 39.8 | 56.2 | 48.0 | 168.2 | 61.7 | 116.4 | 5.6 | 7.7 | 62.6 | 147.3 | 86.1 | 17.9 | 2.5 | 14.2 | 14.3 | 7.3 | 5.2 | 0.8 |
| 150706 | 58.5 | 249.4 | 45.0 | 46.1 | 48.9 | 184.9 | 71.6 | 124.9 | 9.3 | 12.2 | 78.1 | 188.8 | 112.2 | 16.3 | 2.3 | 16.4 | 15.0 | 6.4 | 6.4 | 1.1 |
| 127342 | 53.7 | 192.3 | 23.5 | 44.2 | 37.9 | 145.5 | 58.8 | 150.0 | 12.7 | 20.5 | 85.1 | 183.0 | 93.5 | 26.7 | 1.5 | 18.9 | 12.7 | 7.0 | 5.8 | 1.0 |
| 115094 | 45.8 | 227.8 | 32.6 | 54.9 | 28.4 | 143.6 | 69.8 | 168.4 | 17.6 | 32.3 | 99.3 | 204.9 | 115.4 | 16.6 | 2.3 | 18.6 | 11.6 | 8.2 | 4.9 | 1.3 |

| AT16.3track1 | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 28244 | 9.5 | 66.5 | 0.0 | 6.3 | 0.0 | 1046.9 | 5.6 | 63.2 | 7.9 | 1837.9 | 14.1 | 22.3 | 8.8 | 1.1 | 1.5 | <LOD | 0.8 | <LOD | 0.5 | <LOD |
| 27487 | 7.7 | 88.4 | 0.0 | 8.2 | 0.0 | 1139.6 | 6.2 | 58.3 | 7.4 | 2062.4 | 14.7 | 22.0 | 5.2 | 2.3 | 2.2 | 1.2 | 1.1 | <LOD | <LOD | <LOD |
| 28354 | 6.1 | 55.2 | 0.0 | 6.3 | 0.0 | 1088.0 | 5.9 | 55.0 | 6.8 | 2020.6 | 21.4 | 21.6 | 12.9 | 0.8 | 1.0 | 2.0 | <LOD | <LOD | 1.1 | 0.2 |
| 30050 | 9.1 | 90.9 | 0.0 | 13.0 | 8.7 | 1133.3 | 7.4 | 54.6 | 8.6 | 1988.7 | 18.9 | 24.1 | 14.7 | 3.3 | 1.2 | 3.2 | 2.4 | <LOD | 0.9 | <LOD |
| 45517 | 10.0 | 111.6 | 0.0 | 11.3 | 0.0 | 986.4 | 10.6 | 56.4 | 7.0 | 1733.8 | 17.8 | 30.2 | 24.0 | 5.0 | 1.9 | 2.9 | 4.1 | 1.9 | 1.9 | 0.2 |
| 55284 | 24.9 | 150.8 | 0.0 | 15.9 | 11.3 | 1064.6 | 13.0 | 87.3 | 6.6 | 1772.6 | 20.7 | 54.0 | 30.3 | 3.7 | 2.3 | 3.2 | 3.6 | 1.6 | 0.5 | 0.3 |
| 70458 | 25.7 | 161.4 | 0.0 | 18.5 | 12.5 | 935.8 | 17.5 | 86.1 | 5.6 | 1513.3 | 47.6 | 57.9 | 32.8 | 10.3 | 2.1 | 5.7 | 5.3 | 3.0 | 1.5 | 0.3 |
| 74735 | 35.1 | 194.3 | 51.8 | 23.0 | 17.9 | 801.8 | 23.3 | 93.1 | 4.3 | 1250.2 | 27.2 | 59.2 | 40.9 | 8.5 | 2.1 | 6.5 | 4.8 | 2.8 | 2.4 | 0.4 |
| 106370 | 46.3 | 204.9 | 41.0 | 37.4 | 31.7 | 609.4 | 25.5 | 98.1 | 3.5 | 912.2 | 20.9 | 60.7 | 42.5 | 11.4 | 1.7 | 9.1 | 7.3 | 3.2 | 2.8 | <LOD |
| 124535 | 56.0 | 199.1 | 97.9 | 36.4 | 29.2 | 471.4 | 25.6 | 114.2 | 2.9 | 662.3 | 23.7 | 65.0 | 44.9 | 12.3 | 2.1 | 8.5 | 7.3 | 3.3 | 4.5 | 0.4 |
| 119168 | 64.5 | 235.7 | 97.4 | 37.8 | 65.8 | 423.0 | 30.1 | 112.7 | 2.0 | 408.6 | 22.0 | 54.4 | 38.3 | 9.7 | 2.9 | 12.4 | 7.4 | 3.3 | 2.4 | 0.5 |
| 152449 | 82.7 | 270.8 | 100.2 | 40.0 | 34.2 | 345.7 | 33.7 | 130.6 | 1.6 | 412.7 | 24.0 | 74.9 | 47.6 | 12.8 | 2.6 | 10.5 | 8.9 | 3.0 | 3.6 | 0.5 |
| 155211 | 82.1 | 259.5 | 128.5 | 49.3 | 68.2 | 270.6 | 31.1 | 117.0 | 1.7 | 179.2 | 22.1 | 71.9 | 46.5 | 13.6 | 3.3 | 9.1 | 7.5 | 4.7 | 3.6 | 0.5 |
| 140098 | 89.7 | 283.5 | 169.0 | 43.7 | 66.5 | 262.7 | 39.4 | 122.3 | 1.1 | 108.7 | 22.9 | 65.3 | 50.5 | 15.9 | 2.5 | 11.1 | 7.6 | 3.3 | 4.1 | 0.5 |
| 183236 | 91.8 | 280.9 | 199.1 | 46.7 | 54.1 | 251.6 | 33.3 | 115.7 | 1.0 | 59.9 | 22.0 | 71.2 | 50.8 | 16.3 | 3.6 | 13.7 | 9.0 | 2.9 | 3.3 | 0.5 |
| 155409 | 96.6 | 264.2 | 199.2 | 52.1 | 81.8 | 240.7 | 40.5 | 117.9 | 0.8 | 42.0 | 22.9 | 69.5 | 52.8 | 17.3 | 2.6 | 12.9 | 9.8 | 4.8 | 3.1 | 0.3 |
| 149702 | 89.1 | 296.7 | 181.3 | 44.7 | 77.2 | 229.0 | 35.4 | 112.8 | 0.7 | 23.6 | 20.0 | 69.2 | 51.3 | 15.2 | 3.2 | 12.3 | 8.2 | 4.1 | 2.6 | 0.5 |
| 171777 | 101.7 | 324.4 | 182.7 | 55.0 | 58.4 | 220.0 | 38.6 | 120.5 | 0.5 | 18.3 | 18.2 | 67.5 | 53.2 | 11.8 | 3.1 | 9.9 | 9.5 | 4.0 | 4.3 | 0.4 |
| 156418 | 87.9 | 306.4 | 291.9 | 46.9 | 65.6 | 234.8 | 37.6 | 119.5 | 0.6 | 13.7 | 20.8 | 72.9 | 63.7 | 13.9 | 2.6 | 12.1 | 10.5 | 4.5 | 3.1 | 0.4 |
| 159408 | 83.8 | 295.3 | 147.5 | 39.0 | 52.5 | 211.6 | 36.1 | 108.0 | 0.4 | 9.3 | 19.5 | 64.1 | 53.6 | 14.0 | 2.7 | 11.7 | 7.6 | 4.2 | 2.9 | 0.3 |
| 146798 | 94.3 | 332.4 | 114.6 | 55.3 | 59.2 | 205.2 | 35.7 | 108.5 | 0.4 | 8.9 | 20.3 | 68.2 | 48.5 | 11.6 | 3.0 | 9.7 | 7.3 | 4.0 | 4.4 | 0.6 |
| 155967 | 80.6 | 276.7 | 89.7 | 39.7 | 52.5 | 193.3 | 38.4 | 102.8 | 0.3 | 7.1 | 19.2 | 63.0 | 46.6 | 13.6 | 2.3 | 10.0 | 8.0 | 2.4 | 4.4 | 0.6 |
| 167633 | 80.7 | 299.7 | 74.4 | 52.4 | 51.5 | 213.0 | 36.3 | 99.1 | 0.5 | 8.3 | 20.7 | 63.7 | 50.0 | 11.4 | 2.7 | 10.7 | 6.9 | 3.2 | 3.6 | 0.3 |
| 162634 | 77.0 | 288.2 | 57.0 | 52.4 | 55.4 | 197.7 | 35.4 | 104.3 | 0.5 | 7.1 | 21.3 | 66.8 | 59.1 | 13.1 | 3.3 | 10.7 | 6.3 | 3.6 | 3.4 | 0.4 |
| 173616 | 80.5 | 345.3 | 53.9 | 45.6 | 53.1 | 214.1 | 39.2 | 101.6 | 0.4 | 7.0 | 23.2 | 71.3 | 62.2 | 18.4 | 2.5 | 10.8 | 7.8 | 5.2 | 4.3 | 0.6 |
| 159523 | 90.2 | 342.5 | 60.4 | 46.5 | 62.3 | 208.8 | 40.3 | 119.0 | 0.5 | 5.7 | 20.9 | 66.0 | 49.0 | 13.2 | 2.6 | 12.7 | 9.5 | 5.7 | 3.2 | 0.6 |
| 146189 | 93.3 | 306.2 | 47.9 | 46.7 | 64.1 | 197.0 | 36.3 | 104.9 | 0.4 | 5.9 | 20.3 | 64.1 | 55.5 | 9.1 | 2.4 | 11.4 | 6.6 | 3.4 | 2.6 | 0.3 |
| 166524 | 80.4 | 321.6 | 62.4 | 50.8 | 48.7 | 222.8 | 38.5 | 110.6 | 0.4 | 6.0 | 19.7 | 61.8 | 45.3 | 14.1 | 3.1 | 9.0 | 6.6 | 2.9 | 3.3 | 0.4 |
| 175746 | 79.5 | 285.9 | 48.6 | 44.6 | 52.6 | 216.0 | 37.5 | 105.5 | 0.4 | 5.8 | 20.7 | 64.6 | 50.4 | 13.1 | 2.8 | 12.5 | 8.5 | 3.8 | 3.4 | 0.7 |
| 140765 | 86.0 | 308.2 | 43.5 | 43.4 | 50.2 | 217.8 | 39.4 | 106.9 | 0.6 | 6.7 | 18.0 | 68.7 | 51.3 | 12.3 | 2.9 | 9.6 | 7.9 | 2.9 | 3.3 | 0.4 |
| 145123 | 73.4 | 257.5 | 49.8 | 54.5 | 59.2 | 211.6 | 33.8 | 107.0 | 0.3 | 6.6 | 19.2 | 62.2 | 49.0 | 9.5 | 2.6 | 9.0 | 8.6 | 2.4 | 1.2 | 0.3 |
| 150102 | 87.8 | 267.8 | 35.4 | 36.4 | 46.4 | 206.9 | 33.0 | 98.0 | 0.7 | 6.2 | 19.3 | 60.9 | 43.1 | 13.3 | 2.0 | 13.8 | 7.3 | 3.4 | 2.2 | 0.4 |
| 173139 | 95.5 | 327.5 | 101.2 | 47.3 | 51.0 | 220.4 | 37.9 | 112.4 | 0.5 | 7.2 | 19.0 | 67.1 | 49.4 | 11.3 | 2.6 | 12.5 | 10.4 | 4.1 | 2.9 | 0.5 |
| 177199 | 92.4 | 296.7 | 83.9 | 46.6 | 54.2 | 233.5 | 38.1 | 120.3 | 0.5 | 5.5 | 19.7 | 58.5 | 43.7 | 9.4 | 2.4 | 12.4 | 8.4 | 2.8 | 3.0 | 0.3 |
| 164491 | 92.1 | 293.5 | 108.9 | 54.9 | 70.9 | 241.0 | 39.0 | 108.6 | 0.4 | 6.6 | 19.0 | 59.2 | 44.5 | 12.8 | 2.1 | 11.3 | 6.7 | 3.4 | 2.5 | 0.4 |
| 159762 | 85.9 | 272.4 | 133.9 | 44.0 | 49.7 | 216.7 | 31.1 | 88.5 | 0.4 | 7.1 | 15.1 | 51.2 | 39.7 | 9.1 | 3.3 | 10.2 | 6.2 | 2.9 | 2.8 | 0.5 |
| 173555 | 100.7 | 217.9 | 181.6 | 41.3 | 61.6 | 205.5 | 30.1 | 90.3 | 0.4 | 6.3 | 14.8 | 47.4 | 34.6 | 8.0 | 2.3 | 7.9 | 7.4 | 2.3 | 2.0 | 0.3 |
| 156556 | 114.1 | 210.8 | 263.1 | 43.9 | 69.7 | 223.8 | 30.3 | 95.3 | 0.4 | 6.4 | 16.2 | 49.3 | 38.5 | 7.6 | 2.2 | 6.0 | 6.0 | 2.3 | 3.3 | 0.4 |
| 154394 | 113.1 | 202.3 | 277.1 | 46.7 | 50.5 | 213.3 | 24.6 | 79.1 | 0.4 | 5.1 | 14.1 | 38.8 | 36.6 | 8.2 | 2.0 | 7.0 | 3.8 | 3.0 | 1.7 | 0.2 |
| 140715 | 107.9 | 187.4 | 308.6 | 41.7 | 57.4 | 192.1 | 21.0 | 71.0 | 0.2 | 4.9 | 10.7 | 29.6 | 25.0 | 7.8 | 1.3 | 8.0 | 4.7 | 1.9 | 1.8 | 0.3 |
| 170330 | 124.3 | 202.1 | 475.1 | 45.2 | 67.7 | 195.2 | 21.4 | 70.3 | 0.2 | 5.5 | 9.4 | 38.8 | 25.9 | 6.2 | 1.9 | 6.3 | 4.9 | 1.9 | 1.6 | 0.3 |
| 163688 | 128.1 | 155.1 | 780.5 | 45.4 | 74.4 | 186.0 | 16.4 | 66.7 | 0.3 | 4.6 | 8.7 | 32.3 | 27.0 | 7.0 | 1.4 | 6.2 | 4.7 | 2.2 | 1.5 | 0.2 |
| 161721 | 132.8 | 175.7 | 643.1 | 44.2 | 63.7 | 196.0 | 17.2 | 63.2 | 0.4 | 4.2 | 10.3 | 33.5 | 26.6 | 8.1 | 1.6 | 7.4 | 4.5 | 1.1 | 1.2 | 0.2 |
| 164513 | 119.9 | 177.3 | 687.3 | 37.7 | 81.9 | 180.2 | 17.8 | 60.2 | 0.4 | 3.7 | 10.0 | 31.4 | 25.2 | 7.2 | 1.4 | 5.5 | 4.0 | 2.2 | 1.0 | 0.1 |
| 159832 | 113.6 | 141.7 | 837.0 | 40.2 | 72.4 | 181.2 | 20.8 | 65.2 | 0.3 | 3.7 | 10.2 | 32.6 | 27.6 | 7.0 | 1.7 | 6.4 | 4.2 | 2.0 | 1.2 | 0.4 |
| 166206 | 128.9 | 171.8 | 684.4 | 35.0 | 72.6 | 180.5 | 21.0 | 67.1 | 0.4 | 3.9 | 11.4 | 35.7 | 38.3 | 7.9 | 2.0 | 7.0 | 4.1 | 2.4 | 1.0 | 0.1 |
| 154656 | 112.0 | 180.7 | 553.3 | 37.7 | 64.3 | 176.8 | 23.7 | 81.9 | 0.3 | 4.2 | 12.8 | 43.5 | 33.0 | 9.8 | 1.8 | 6.9 | 5.1 | 2.5 | 2.2 | 0.2 |
| 144173 | 114.1 | 170.4 | 510.9 | 35.2 | 65.3 | 185.8 | 24.0 | 94.5 | 0.6 | 4.8 | 16.3 | 44.4 | 34.4 | 9.5 | 2.2 | 8.0 | 4.7 | 3.0 | 2.5 | 0.5 |
| 135649 | 98.9 | 199.8 | 424.0 | 36.6 | 75.2 | 178.2 | 23.9 | 93.6 | 0.4 | 5.2 | 13.4 | 45.2 | 37.2 | 8.4 | 1.7 | 8.6 | 5.1 | 2.5 | 1.6 | 0.3 |
| 171611 | 110.9 | 234.5 | 579.0 | 45.2 | 77.2 | 199.4 | 31.5 | 110.1 | 0.7 | 6.1 | 17.3 | 55.2 | 44.6 | 10.2 | 2.1 | 10.1 | 5.4 | 2.7 | 1.6 | 0.5 |
| 163318 | 114.1 | 209.7 | 477.2 | 42.6 | 88.1 | 197.9 | 29.3 | 112.7 | 0.7 | 6.0 | 14.8 | 51.2 | 47.5 | 11.9 | 3.0 | 8.4 | 7.5 | 3.2 | 3.4 | 0.4 |
| 155441 | 130.1 | 237.0 | 362.0 | 41.2 | 114.4 | 221.2 | 31.0 | 105.3 | 0.7 | 6.1 | 18.1 | 58.0 | 42.4 | 10.9 | 2.8 | 9.7 | 6.9 | 3.3 | 2.3 | 0.1 |
| 163145 | 117.1 | 209.7 | 290.5 | 44.6 | 63.3 | 196.2 | 27.2 | 109.2 | 0.5 | 4.5 | 17.4 | 49.4 | 36.2 | 10.0 | 2.3 | 7.6 | 6.0 | 3.1 | 2.7 | 0.2 |
| 148497 | 106.8 | 192.4 | 446.4 | 45.3 | 68.8 | 196.9 | 27.2 | 97.5 | 0.4 | 3.7 | 14.7 | 47.0 | 40.4 | 9.0 | 2.0 | 8.8 | 4.3 | 3.5 | 1.8 | 0.3 |
| 162633 | 113.7 | 193.6 | 313.7 | 41.4 | 86.9 | 200.7 | 24.9 | 90.5 | 0.5 | 4.4 | 14.0 | 44.1 | 33.6 | 11.8 | 1.8 | 6.8 | 6.2 | 3.0 | 1.3 | 0.3 |
| 170809 | 109.9 | 190.7 | 550.9 | 43.7 | 102.6 | 204.4 | 24.5 | 93.2 | 0.4 | 4.0 | 15.6 | 47.9 | 34.2 | 11.4 | 2.4 | 8.9 | 6.4 | 2.7 | 2.2 | 0.1 |
| 162169 | 108.3 | 195.8 | 439.0 | 45.3 | 86.6 | 193.4 | 24.7 | 72.3 | 0.4 | 4.7 | 16.1 | 46.7 | 38.2 | 9.4 | 1.8 | 8.5 | 5.5 | 2.0 | 2.1 | 0.4 |
| 165020 | 105.1 | 215.5 | 293.9 | 37.1 | 80.5 | 195.2 | 24.9 | 77.0 | 0.3 | 4.2 | 15.7 | 48.2 | 37.8 | 9.2 | 1.6 | 8.2 | 4.5 | 2.6 | 2.8 | 0.2 |
| 164045 | 102.6 | 197.8 | 269.3 | 48.3 | 72.1 | 183.0 | 26.3 | 76.8 | 0.3 | 4.0 | 14.9 | 47.8 | 34.6 | 10.6 | 2.2 | 9.0 | 4.4 | 2.9 | 1.5 | 0.3 |
| 156458 | 101.0 | 213.6 | 347.8 | 41.0 | 54.6 | 197.3 | 26.2 | 87.3 | 0.3 | 4.1 | 13.6 | 47.4 | 34.6 | 8.5 | 1.9 | 8.3 | 4.9 | 3.4 | 1.9 | 0.4 |
| 161607 | 97.3 | 223.3 | 279.9 | 42.4 | 82.9 | 188.0 | 30.4 | 75.2 | 0.4 | 3.6 | 14.2 | 47.4 | 40.5 | 10.0 | 2.0 | 9.2 | 6.0 | 3.8 | 2.0 | 0.3 |
| 178068 | 92.3 | 266.4 | 147.2 | 45.2 | 53.6 | 192.2 | 31.1 | 88.9 | 0.4 | 3.4 | 17.0 | 52.1 | 36.8 | 14.0 | 2.1 | 8.2 | 6.2 | 2.2 | 2.1 | 0.4 |
| 167609 | 87.2 | 239.8 | 156.5 | 45.7 | 72.6 | 205.0 | 29.5 | 91.0 | 0.3 | 3.9 | 18.1 | 58.5 | 49.4 | 10.7 | 2.0 | 8.9 | 9.4 | 4.2 | 3.5 | 0.4 |
| 149055 | 89.3 | 278.7 | 115.5 | 40.9 | 65.3 | 194.1 | 33.9 | 78.8 | 0.4 | 3.4 | 15.8 | 49.3 | 48.5 | 14.0 | 2.1 | 10.8 | 5.1 | 3.5 | 2.0 | 0.5 |
| 157950 | 89.1 | 304.7 | 111.6 | 43.8 | 91.0 | 202.1 | 32.7 | 93.5 | 0.5 | 3.4 | 16.2 | 62.9 | 49.0 | 13.7 | 2.5 | 10.1 | 7.5 | 3.4 | 3.9 | 0.3 |
| 138095 | 82.1 | 264.8 | 45.6 | 45.9 | 87.7 | 192.5 | 30.8 | 78.4 | 0.4 | 4.1 | 19.5 | 56.4 | 38.8 | 12.3 | 2.6 | 10.0 | 7.5 | 3.5 | 1.2 | 0.4 |
| 159807 | 82.6 | 268.1 | 72.4 | 51.1 | 74.2 | 209.5 | 34.0 | 105.3 | 0.3 | 3.3 | 18.0 | 59.9 | 43.2 | 13.1 | 2.4 | 9.8 | 6.3 | 4.7 | 1.4 | 0.3 |
| 158065 | 81.9 | 299.4 | 58.7 | 47.4 | 66.9 | 198.6 | 33.2 | 91.3 | 0.4 | 4.2 | 19.1 | 58.2 | 45.3 | 12.0 | 2.3 | 11.5 | 6.7 | 3.1 | 2.7 | 0.5 |
| 160921 | 88.9 | 278.9 | 70.3 | 54.4 | 70.4 | 209.9 | 34.5 | 94.3 | 0.4 | 4.0 | 19.5 | 61.8 | 41.0 | 13.1 | 1.7 | 11.5 | 7.1 | 3.7 | 4.1 | 0.4 |
| 166237 | 86.2 | 266.2 | 121.5 | 43.6 | 100.8 | 207.1 | 37.8 | 95.1 | 0.4 | 3.5 | 20.6 | 64.8 | 44.8 | 14.7 | 2.5 | 7.9 | 7.4 | 3.2 | 4.4 | 0.4 |
| 160449 | 88.0 | 271.9 | 106.0 | 44.6 | 89.3 | 201.7 | 33.9 | 93.8 | 0.4 | 3.2 | 16.1 | 61.3 | 59.4 | 11.5 | 2.5 | 8.6 | 7.5 | 4.6 | 3.3 | 0.6 |
| 150020 | 77.1 | 242.0 | 147.6 | 51.9 | 68.1 | 175.9 | 34.4 | 84.4 | 0.4 | 2.6 | 16.3 | 55.6 | 42.4 | 9.9 | 2.5 | 11.4 | 6.4 | 3.2 | 2.8 | 0.4 |
| 165667 | 86.4 | 257.4 | 168.0 | 46.3 | 71.8 | 209.9 | 34.2 | 87.2 | 0.4 | 2.7 | 16.6 | 55.3 | 46.2 | 12.2 | 2.8 | 9.5 | 6.7 | 3.0 | 3.1 | 0.6 |
| 158754 | 84.8 | 269.0 | 216.9 | 48.9 | 78.5 | 183.1 | 29.4 | 88.7 | 0.3 | 2.6 | 16.2 | 54.4 | 44.9 | 13.2 | 2.1 | 8.7 | 7.5 | 3.4 | 1.9 | 0.4 |
| 178378 | 94.0 | 240.1 | 411.9 | 49.2 | 97.4 | 194.0 | 33.4 | 80.0 | 0.4 | 2.5 | 18.1 | 49.8 | 40.5 | 11.5 | 3.1 | 6.8 | 7.6 | 3.0 | 3.9 | 0.6 |
| 158926 | 95.3 | 222.7 | 293.1 | 44.3 | 52.1 | 180.2 | 27.8 | 84.8 | 0.3 | 2.7 | 14.8 | 43.3 | 37.5 | 10.2 | 1.8 | 6.3 | 6.3 | 2.3 | 2.8 | 0.2 |
| 169121 | 106.8 | 224.6 | 393.6 | 45.4 | 63.9 | 201.1 | 29.5 | 87.6 | 0.4 | 2.5 | 15.2 | 52.4 | 39.0 | 8.9 | 1.8 | 10.4 | 5.5 | 3.6 | 2.9 | 0.2 |
| 140775 | 89.5 | 223.1 | 510.4 | 44.7 | 60.3 | 174.8 | 29.5 | 70.2 | 0.5 | 2.6 | 13.6 | 42.7 | 35.9 | 10.0 | 1.4 | 8.5 | 6.2 | 1.7 | 1.3 | 0.4 |
| 176291 | 114.6 | 239.1 | 345.9 | 43.3 | 79.2 | 195.9 | 28.2 | 83.9 | 0.5 | 2.9 | 16.8 | 51.2 | 38.1 | 9.4 | 1.9 | 8.6 | 8.2 | 2.8 | 2.5 | 0.3 |
| 151723 | 99.2 | 209.8 | 469.2 | 49.1 | 57.6 | 182.0 | 26.3 | 80.6 | 0.5 | 2.6 | 13.4 | 46.5 | 40.9 | 9.7 | 2.1 | 6.6 | 6.9 | 2.7 | 2.5 | 0.2 |
| 157257 | 112.6 | 210.5 | 494.6 | 43.5 | 83.7 | 172.3 | 26.4 | 83.5 | 0.5 | 2.6 | 15.5 | 47.6 | 36.5 | 10.4 | 1.9 | 8.5 | 5.3 | 3.3 | 1.9 | 0.2 |
| 159947 | 117.9 | 249.1 | 366.8 | 47.4 | 60.4 | 198.7 | 27.7 | 75.1 | 0.6 | 3.3 | 12.6 | 45.2 | 42.2 | 8.2 | 2.1 | 7.4 | 4.8 | 3.9 | 2.9 | 0.3 |
| 159363 | 121.2 | 220.5 | 661.8 | 45.7 | 67.8 | 189.3 | 27.6 | 81.4 | 0.5 | 2.8 | 15.7 | 46.6 | 38.6 | 7.1 | 2.4 | 5.7 | 6.6 | 2.4 | 1.8 | 0.5 |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 149817 | 119.7 | 201.3 | 605.7 | 47.1 | 55.4 | 200.9 | 25.5 | 89.4 | 0.5 | 2.3 | 14.9 | 47.5 | 35.4 | 11.6 | 2.3 | 9.7 | 4.6 | 2.5 | 3.3 | 0.3 |
| 167945 | 125.5 | 222.3 | 591.8 | 47.7 | 59.4 | 202.5 | 25.8 | 88.9 | 0.5 | 1.8 | 14.1 | 42.9 | 39.6 | 9.3 | 2.1 | 8.4 | 5.8 | 1.7 | 2.5 | 0.5 |
| 178272 | 126.1 | 244.3 | 533.8 | 42.7 | 64.5 | 220.1 | 25.0 | 93.0 | 0.5 | 2.5 | 13.0 | 44.8 | 37.2 | 9.4 | 2.1 | 6.6 | 4.4 | 1.6 | 2.0 | 0.5 |
| 168807 | 123.4 | 226.4 | 777.1 | 47.9 | 50.9 | 210.7 | 23.5 | 87.6 | 0.7 | 2.9 | 14.2 | 40.9 | 30.0 | 9.4 | 2.9 | 8.3 | 5.7 | 2.5 | 2.3 | 0.4 |
| 150141 | 121.8 | 222.1 | 565.2 | 43.1 | 63.7 | 206.7 | 23.0 | 85.2 | 0.6 | 2.5 | 12.7 | 38.9 | 38.7 | 8.6 | 1.9 | 11.9 | 5.3 | 2.1 | 1.2 | 0.1 |
| 158405 | 121.4 | 202.5 | 799.5 | 40.4 | 57.4 | 212.7 | 23.5 | 81.5 | 0.6 | 2.5 | 9.8 | 38.3 | 29.3 | 7.8 | 1.9 | 8.2 | 3.8 | 2.1 | 3.0 | 0.2 |
| 175140 | 134.0 | 208.3 | 556.7 | 45.0 | 52.3 | 193.1 | 24.6 | 85.1 | 0.6 | 2.3 | 15.2 | 41.5 | 39.6 | 8.4 | 2.0 | 6.2 | 4.6 | 2.4 | 2.6 | 0.5 |
| 162216 | 126.7 | 196.8 | 782.7 | 45.2 | 64.6 | 206.3 | 22.6 | 73.9 | 0.5 | 2.2 | 12.0 | 40.0 | 29.6 | 8.8 | 2.4 | 8.3 | 5.4 | 1.9 | 2.3 | 0.2 |
| 173151 | 121.8 | 218.1 | 495.4 | 44.9 | 74.3 | 198.0 | 23.3 | 86.4 | 0.6 | 2.1 | 11.7 | 37.1 | 36.8 | 8.7 | 2.0 | 6.8 | 4.0 | 2.3 | 2.3 | 0.2 |
| 164218 | 143.0 | 222.4 | 893.2 | 44.1 | 65.5 | 204.5 | 22.6 | 87.0 | 0.5 | 2.1 | 10.3 | 39.0 | 25.9 | 5.5 | 1.4 | 6.3 | 6.5 | 2.5 | 1.0 | 0.2 |
| 157963 | 116.5 | 198.6 | 769.4 | 40.1 | 46.9 | 196.6 | 18.9 | 84.4 | 0.6 | 1.8 | 11.0 | 38.5 | 27.0 | 8.1 | 2.1 | 6.5 | 5.2 | 2.9 | 1.2 | 0.2 |
| 152095 | 119.5 | 183.0 | 817.5 | 40.1 | 60.7 | 191.7 | 18.5 | 84.1 | 0.4 | 1.9 | 11.8 | 36.9 | 26.2 | 10.3 | 1.4 | 6.6 | 3.9 | 0.8 | 0.8 | 0.3 |
| 158714 | 133.3 | 198.9 | 687.3 | 43.1 | 40.1 | 198.5 | 21.8 | 80.3 | 0.5 | 2.1 | 12.5 | 36.6 | 26.3 | 6.8 | 1.6 | 7.8 | 4.5 | 1.7 | 1.1 | 0.4 |
| 168228 | 135.7 | 203.4 | 533.8 | 41.5 | 56.5 | 213.2 | 19.8 | 93.3 | 0.6 | 2.1 | 10.9 | 40.0 | 30.7 | 10.1 | 1.7 | 7.7 | 5.3 | 2.0 | 1.8 | 0.3 |
| 166715 | 138.1 | 229.2 | 625.8 | 43.4 | 68.1 | 231.8 | 22.1 | 88.7 | 0.6 | 2.6 | 13.1 | 43.2 | 35.3 | 8.7 | 1.7 | 8.0 | 6.4 | 2.6 | 1.7 | 0.4 |
| 164433 | 118.7 | 225.9 | 495.3 | 41.9 | 62.9 | 208.1 | 22.4 | 77.4 | 0.6 | 2.2 | 12.4 | 42.4 | 27.9 | 8.7 | 1.8 | 5.9 | 5.6 | 3.2 | 2.4 | 0.2 |
| 142189 | 127.2 | 205.2 | 571.2 | 39.2 | 47.9 | 192.4 | 21.2 | 87.3 | 0.7 | 2.0 | 12.1 | 36.8 | 25.3 | 8.4 | 2.3 | 10.0 | 5.8 | 2.5 | 0.6 | 0.3 |
| 169188 | 134.1 | 206.1 | 530.5 | 40.9 | 51.4 | 202.1 | 24.3 | 96.1 | 0.6 | 2.2 | 14.1 | 44.6 | 26.2 | 8.8 | 2.5 | 7.9 | 7.0 | 1.2 | 2.6 | 0.3 |
| 155771 | 132.7 | 214.9 | 585.8 | 43.4 | 53.6 | 196.8 | 20.7 | 79.8 | 0.6 | 1.9 | 12.2 | 39.4 | 37.6 | 6.1 | 2.0 | 5.8 | 4.7 | 2.1 | 1.2 | 0.2 |
| 164200 | 122.8 | 236.7 | 567.9 | 44.4 | 65.2 | 223.2 | 22.6 | 95.1 | 0.7 | 1.5 | 12.3 | 46.9 | 34.5 | 7.2 | 1.9 | 7.2 | 6.1 | 2.8 | 0.9 | 0.4 |
| 143421 | 113.0 | 229.6 | 686.5 | 33.7 | 70.5 | 191.6 | 21.0 | 81.2 | 0.6 | 1.7 | 12.3 | 43.5 | 26.5 | 10.0 | 2.5 | 8.4 | 6.8 | 3.1 | 2.0 | 0.3 |
| 160568 | 111.6 | 189.9 | 402.3 | 35.3 | 53.1 | 197.3 | 23.4 | 77.8 | 0.6 | 1.7 | 14.7 | 46.8 | 35.3 | 10.0 | 1.4 | 8.9 | 6.6 | 2.1 | 2.3 | 0.3 |
| 147461 | 101.4 | 185.0 | 534.7 | 42.9 | 55.4 | 182.0 | 25.9 | 84.3 | 0.6 | 1.5 | 14.2 | 40.5 | 41.2 | 8.7 | 2.0 | 9.2 | 6.3 | 3.3 | 3.6 | 0.2 |
| 160738 | 105.4 | 232.8 | 541.5 | 48.0 | 66.1 | 203.5 | 26.8 | 92.6 | 0.7 | 1.7 | 16.2 | 49.3 | 37.9 | 11.0 | 2.0 | 6.7 | 7.6 | 3.2 | 2.1 | 0.4 |
| 170087 | 107.7 | 223.4 | 260.9 | 53.1 | 62.8 | 193.6 | 28.9 | 87.0 | 0.3 | 1.8 | 14.9 | 51.5 | 39.8 | 10.0 | 1.8 | 7.6 | 7.3 | 3.0 | 2.0 | 0.3 |
| 166436 | 105.4 | 233.6 | 365.8 | 54.3 | 57.6 | 211.9 | 29.0 | 78.6 | 0.4 | 1.5 | 14.5 | 51.5 | 43.7 | 11.2 | 1.9 | 8.5 | 6.8 | 2.7 | 2.3 | 0.3 |
| 160989 | 89.5 | 225.8 | 205.1 | 42.0 | 75.0 | 204.7 | 30.7 | 76.1 | 0.3 | 1.4 | 14.6 | 51.7 | 39.7 | 7.4 | 2.5 | 6.8 | 7.5 | 2.3 | 3.0 | 0.4 |
| 154863 | 102.9 | 272.8 | 239.0 | 50.4 | 48.7 | 197.3 | 30.5 | 75.0 | 0.3 | 1.5 | 16.4 | 51.7 | 36.4 | 10.2 | 3.0 | 9.5 | 9.3 | 3.1 | 2.2 | 0.3 |
| 165180 | 96.8 | 258.6 | 126.2 | 45.3 | 54.8 | 193.0 | 34.2 | 77.2 | 0.5 | 1.6 | 19.1 | 55.2 | 46.7 | 11.7 | 1.8 | 11.9 | 6.9 | 3.1 | 1.8 | 0.5 |
| 153069 | 79.1 | 233.2 | 137.8 | 47.3 | 67.3 | 192.6 | 32.5 | 79.3 | 0.4 | 1.3 | 17.1 | 56.7 | 40.9 | 11.8 | 2.2 | 11.1 | 6.9 | 3.7 | 2.2 | 0.5 |
| 168381 | 80.5 | 246.2 | 124.9 | 42.4 | 55.7 | 190.4 | 31.4 | 75.1 | 0.3 | 1.4 | 16.1 | 55.9 | 45.4 | 14.0 | 2.1 | 12.3 | 7.5 | 3.3 | 3.3 | 0.6 |
| 157614 | 76.2 | 256.9 | 81.5 | 43.6 | 77.0 | 198.2 | 35.9 | 78.7 | 0.2 | 1.8 | 18.5 | 55.6 | 55.7 | 11.7 | 2.3 | 11.2 | 7.6 | 4.0 | 2.3 | 0.2 |
| 160682 | 77.0 | 256.8 | 47.3 | 47.8 | 54.5 | 190.4 | 37.0 | 73.0 | 0.3 | 1.6 | 17.3 | 57.9 | 43.7 | 11.9 | 1.9 | 9.3 | 6.9 | 4.8 | 3.1 | 0.6 |
| 160172 | 77.9 | 252.0 | 31.9 | 55.5 | 59.1 | 193.0 | 35.2 | 91.7 | 0.3 | 1.5 | 19.4 | 63.1 | 40.7 | 13.4 | 2.2 | 9.8 | 8.7 | 3.6 | 3.2 | 0.3 |
| 167524 | 74.0 | 261.1 | 49.7 | 39.8 | 55.8 | 194.3 | 37.1 | 80.9 | 0.3 | 1.3 | 18.6 | 59.7 | 47.5 | 9.7 | 2.4 | 8.0 | 7.2 | 2.9 | 2.1 | 0.3 |
| 170032 | 90.2 | 277.8 | 42.4 | 54.8 | 58.0 | 194.9 | 37.7 | 75.2 | 0.3 | 1.3 | 20.7 | 57.2 | 46.7 | 13.1 | 1.9 | 11.2 | 7.8 | 4.3 | 3.9 | 0.3 |
| 163239 | 77.0 | 291.6 | 40.6 | 46.4 | 54.6 | 200.5 | 39.8 | 74.4 | 0.3 | 1.2 | 18.3 | 56.2 | 47.3 | 8.6 | 2.4 | 9.7 | 6.2 | 4.3 | 2.8 | 0.5 |
| 166479 | 82.4 | 284.5 | 28.4 | 54.3 | 65.6 | 204.0 | 37.6 | 75.3 | 0.4 | 1.4 | 17.2 | 60.5 | 46.0 | 10.6 | 2.2 | 7.9 | 6.0 | 2.5 | 2.8 | 0.5 |
| 146088 | 71.6 | 254.6 | 29.4 | 43.5 | 82.7 | 183.2 | 33.9 | 74.1 | 0.4 | 1.3 | 16.8 | 57.2 | 48.1 | 10.0 | 2.2 | 9.8 | 6.9 | 3.5 | 2.1 | 0.4 |
| 143139 | 72.2 | 256.1 | 26.3 | 46.8 | 51.0 | 183.1 | 33.6 | 82.2 | 0.3 | 1.2 | 16.6 | 55.8 | 45.7 | 12.2 | 2.2 | 9.6 | 7.1 | 3.5 | 3.1 | 0.4 |
| 161040 | 89.2 | 274.0 | 34.2 | 57.0 | 64.3 | 204.9 | 39.5 | 80.6 | 0.3 | 1.4 | 18.7 | 64.5 | 57.6 | 10.4 | 2.1 | 11.3 | 8.7 | 3.3 | 3.6 | 0.3 |
| 155420 | 72.0 | 282.8 | 33.7 | 47.8 | 71.3 | 193.4 | 32.6 | 80.8 | 0.3 | 1.3 | 17.3 | 57.6 | 43.0 | 12.7 | 2.6 | 7.6 | 8.4 | 4.7 | 2.9 | 0.5 |
| 149489 | 81.6 | 283.6 | 46.5 | 54.4 | 86.9 | 200.4 | 35.9 | 85.6 | 0.3 | 1.5 | 17.2 | 57.1 | 46.4 | 12.4 | 1.8 | 10.5 | 8.3 | 3.0 | 2.6 | 0.5 |
| 164924 | 81.9 | 291.2 | 0.0 | 51.0 | 61.9 | 202.4 | 37.9 | 97.3 | 0.4 | 1.4 | 19.3 | 65.8 | 60.6 | 19.9 | 2.6 | 9.9 | 7.8 | 3.3 | 2.9 | 0.3 |
| 163825 | 83.8 | 317.1 | 27.5 | 45.7 | 57.4 | 201.5 | 36.1 | 91.4 | 0.4 | 1.4 | 18.6 | 56.3 | 56.7 | 11.3 | 2.2 | 9.8 | 7.8 | 4.3 | 3.7 | 0.4 |
| 168979 | 80.0 | 301.6 | 33.1 | 46.7 | 84.8 | 193.4 | 35.5 | 87.1 | 0.4 | 1.5 | 18.9 | 63.8 | 61.5 | 11.8 | 2.7 | 10.1 | 7.8 | 3.7 | 4.3 | 0.5 |
| 153365 | 74.3 | 327.5 | 32.1 | 51.7 | 81.3 | 199.2 | 42.4 | 98.6 | 0.5 | 1.3 | 21.5 | 67.2 | 49.1 | 13.5 | 2.4 | 11.8 | 9.7 | 5.6 | 3.9 | 0.6 |
| 167796 | 89.0 | 308.7 | 43.6 | 47.8 | 82.6 | 197.8 | 39.9 | 107.8 | 0.5 | 1.3 | 20.7 | 67.2 | 52.6 | 14.4 | 2.9 | 10.1 | 8.6 | 4.0 | 4.1 | 0.5 |
| 147358 | 75.6 | 298.2 | 33.2 | 38.4 | 55.6 | 188.7 | 38.8 | 95.4 | 0.2 | 1.3 | 21.3 | 70.1 | 49.0 | 13.8 | 2.3 | 10.8 | 7.3 | 3.6 | 3.9 | 0.6 |
| 148964 | 72.4 | 279.2 | 30.0 | 49.0 | 71.8 | 198.4 | 36.1 | 89.3 | 0.4 | 1.1 | 21.0 | 66.8 | 39.5 | 12.7 | 2.3 | 13.8 | 9.6 | 4.1 | 1.9 | 0.6 |
| 169589 | 83.6 | 304.0 | 0.0 | 51.6 | 58.5 | 210.9 | 38.8 | 91.2 | 0.5 | 1.4 | 25.5 | 72.9 | 55.5 | 14.1 | 2.4 | 12.3 | 10.2 | 3.4 | 4.7 | 0.6 |
| 157739 | 75.7 | 298.6 | 0.0 | 46.2 | 71.9 | 205.7 | 42.0 | 99.9 | 0.4 | 1.2 | 21.9 | 65.0 | 53.9 | 13.5 | 3.0 | 8.6 | 8.2 | 4.5 | 3.0 | 0.4 |
| 146035 | 80.4 | 270.2 | 57.1 | 42.7 | 75.1 | 188.9 | 34.6 | 85.3 | 0.4 | 1.3 | 18.1 | 60.5 | 53.1 | 13.4 | 3.2 | 11.3 | 7.8 | 2.9 | 4.0 | 0.4 |
| 147003 | 82.4 | 269.4 | 18.7 | 49.9 | 70.8 | 179.0 | 34.6 | 83.5 | 0.4 | 1.1 | 20.0 | 60.5 | 41.3 | 11.8 | 2.3 | 10.6 | 8.0 | 3.5 | 1.5 | 0.5 |
| 166009 | 90.7 | 305.3 | 32.1 | 51.5 | 74.4 | 203.0 | 39.0 | 105.0 | 0.5 | 0.9 | 22.7 | 61.4 | 67.1 | 12.4 | 2.4 | 10.8 | 7.4 | 4.1 | 3.9 | 0.4 |
| 154045 | 90.2 | 270.6 | 46.5 | 50.5 | 61.4 | 206.9 | 34.7 | 105.5 | 0.4 | 1.2 | 19.4 | 65.0 | 45.0 | 11.9 | 2.5 | 9.8 | 8.6 | 3.1 | 4.4 | 0.1 |
| 172216 | 91.4 | 318.4 | 42.0 | 45.1 | 73.1 | 225.7 | 38.1 | 94.7 | 0.5 | 1.1 | 19.1 | 63.7 | 44.0 | 15.0 | 1.9 | 10.8 | 7.9 | 3.2 | 3.7 | 0.3 |
| 161803 | 91.2 | 305.5 | 62.9 | 47.8 | 70.2 | 213.2 | 34.9 | 106.9 | 0.4 | 1.2 | 22.8 | 69.4 | 51.4 | 12.8 | 2.0 | 12.1 | 7.9 | 3.7 | 5.5 | 0.3 |
| 148277 | 82.9 | 254.6 | 77.2 | 44.2 | 62.1 | 207.4 | 32.9 | 90.6 | 0.4 | 1.2 | 17.0 | 56.4 | 44.6 | 10.8 | 2.3 | 9.6 | 8.5 | 3.3 | 2.1 | 0.4 |
| 153684 | 83.9 | 254.1 | 161.3 | 47.4 | 55.8 | 214.5 | 32.4 | 85.0 | 0.4 | 1.2 | 17.6 | 52.5 | 39.9 | 10.9 | 2.4 | 8.6 | 7.2 | 3.8 | 2.6 | 0.4 |
| 197177 | 109.6 | 272.7 | 171.5 | 53.9 | 84.4 | 202.1 | 30.7 | 77.9 | 0.4 | 0.9 | 16.5 | 50.1 | 38.3 | 11.6 | 2.2 | 6.1 | 7.7 | 2.5 | 2.9 | 0.4 |
| 150629 | 94.2 | 222.7 | 232.1 | 45.6 | 74.3 | 190.4 | 27.4 | 77.4 | 0.3 | 1.0 | 15.9 | 50.7 | 35.6 | 9.0 | 2.3 | 8.4 | 7.8 | 2.5 | 2.2 | 0.4 |
| 169670 | 106.3 | 227.8 | 256.8 | 45.5 | 85.1 | 188.3 | 26.3 | 79.7 | 0.3 | 0.9 | 14.5 | 46.4 | 35.8 | 10.4 | 1.9 | 7.0 | 5.4 | 2.2 | 2.0 | 0.4 |
| 159931 | 96.6 | 201.2 | 290.5 | 38.9 | 72.0 | 197.8 | 23.5 | 68.7 | 0.4 | 0.9 | 13.8 | 42.9 | 32.1 | 8.4 | 1.9 | 7.6 | 3.1 | 3.0 | 2.2 | 0.2 |
| 167445 | 102.2 | 203.9 | 220.5 | 35.1 | 77.6 | 198.0 | 23.1 | 69.6 | 0.4 | 0.9 | 16.7 | 40.8 | 29.0 | 7.7 | 1.7 | 6.8 | 5.6 | 2.0 | 2.2 | 0.3 |
| 151848 | 108.2 | 176.2 | 209.9 | 40.5 | 69.0 | 182.9 | 21.5 | 71.9 | 0.3 | 0.9 | 12.5 | 39.6 | 34.5 | 8.6 | 2.0 | 7.4 | 5.3 | 3.1 | 2.2 | 0.5 |
| 183901 | 101.0 | 212.8 | 249.1 | 44.4 | 81.9 | 200.1 | 24.8 | 79.1 | 0.5 | 0.7 | 14.7 | 39.1 | 34.4 | 7.9 | 1.8 | 8.3 | 4.9 | 2.8 | 1.4 | 0.6 |
| 159191 | 104.4 | 199.5 | 261.9 | 41.7 | 68.4 | 195.2 | 25.2 | 95.2 | 0.5 | 1.0 | 15.0 | 43.5 | 37.7 | 6.8 | 2.3 | 9.6 | 5.5 | 3.0 | 1.4 | 0.4 |
| 157351 | 102.2 | 209.8 | 186.9 | 43.0 | 104.9 | 197.5 | 28.0 | 95.4 | 0.6 | 1.0 | 16.4 | 54.8 | 45.5 | 10.2 | 2.7 | 10.0 | 6.6 | 1.6 | 2.1 | 0.2 |
| 165096 | 101.6 | 216.9 | 226.3 | 39.7 | 81.1 | 194.9 | 27.8 | 111.6 | 0.6 | 0.9 | 17.5 | 53.5 | 50.2 | 11.3 | 2.3 | 9.0 | 6.3 | 3.0 | 4.6 | 0.4 |
| 182230 | 99.3 | 238.9 | 201.6 | 43.8 | 76.6 | 214.3 | 31.2 | 135.7 | 0.8 | 1.0 | 21.5 | 64.8 | 42.8 | 14.1 | 2.1 | 8.9 | 7.2 | 3.3 | 4.1 | 0.5 |
| 199517 | 107.7 | 262.0 | 127.2 | 48.0 | 101.8 | 245.8 | 32.5 | 129.8 | 0.7 | 0.8 | 19.9 | 65.4 | 63.2 | 16.4 | 2.9 | 12.2 | 6.6 | 4.1 | 3.6 | 0.2 |
| 163569 | 100.5 | 279.9 | 132.7 | 53.6 | 85.0 | 227.2 | 38.3 | 124.0 | 0.5 | 1.2 | 18.7 | 64.1 | 52.0 | 15.0 | 2.9 | 9.0 | 7.6 | 3.7 | 3.3 | 0.2 |
| 145747 | 93.1 | 221.7 | 121.8 | 37.7 | 72.7 | 206.0 | 36.5 | 119.9 | 0.8 | 0.9 | 17.4 | 58.4 | 47.1 | 8.9 | 2.0 | 10.2 | 6.6 | 2.4 | 2.3 | 0.4 |
| 169132 | 88.9 | 227.3 | 210.3 | 44.0 | 59.6 | 219.0 | 31.1 | 112.7 | 0.5 | 0.7 | 18.2 | 51.8 | 42.7 | 13.0 | 2.6 | 9.1 | 6.8 | 3.5 | 2.5 | 0.3 |
| 167424 | 100.2 | 242.0 | 265.7 | 46.4 | 74.8 | 217.4 | 30.1 | 101.0 | 0.5 | 0.6 | 18.6 | 52.5 | 39.8 | 9.5 | 2.3 | 8.2 | 6.2 | 3.0 | 2.5 | 0.4 |
| 173477 | 108.4 | 214.6 | 357.9 | 49.5 | 66.9 | 216.5 | 30.4 | 108.6 | 0.4 | 0.6 | 15.7 | 48.8 | 43.6 | 10.8 | 2.0 | 9.5 | 5.6 | 3.2 | 2.1 | 0.3 |
| 166522 | 119.3 | 217.3 | 647.4 | 52.6 | 98.8 | 202.4 | 24.5 | 100.9 | 0.5 | 0.9 | 13.7 | 44.6 | 32.4 | 10.7 | 2.4 | 6.9 | 5.8 | 2.4 | 2.0 | 0.3 |
| 161054 | 120.4 | 181.1 | 513.9 | 38.1 | 105.5 | 202.8 | 24.8 | 80.5 | 0.4 | 0.9 | 12.2 | 33.3 | 34.6 | 6.3 | 1.4 | 8.6 | 4.3 | 1.9 | 1.6 | 0.2 |
| 156535 | 110.7 | 183.3 | 542.9 | 35.3 | 84.3 | 180.9 | 20.9 | 73.5 | 0.3 | 0.7 | 10.5 | 33.9 | 29.8 | 9.6 | 1.5 | 6.7 | 5.3 | 1.8 | 1.0 | 0.3 |
| 153049 | 118.1 | 150.0 | 655.1 | 35.3 | 58.2 | 176.2 | 18.7 | 67.5 | 0.3 | 0.7 | 9.7 | 33.7 | 26.9 | 5.2 | 1.2 | 6.7 | 4.7 | 1.7 | 1.5 | 0.1 |
| 178353 | 136.1 | 187.8 | 742.0 | 47.5 | 82.0 | 198.3 | 16.9 | 62.6 | 0.3 | 0.8 | 9.6 | 30.2 | 24.5 | 8.7 | 1.5 | 6.7 | 4.1 | 2.2 | 1.6 | 0.2 |
| 174921 | 135.8 | 152.8 | 594.4 | 40.3 | 90.0 | 187.3 | 17.1 | 59.9 | 0.2 | 0.9 | 9.3 | 32.3 | 25.9 | 6.2 | 1.5 | 6.5 | 3.2 | 1.5 | 0.4 | 0.2 |
| 167351 | 122.9 | 156.9 | 607.3 | 40.5 | 72.6 | 170.5 | 17.4 | 57.7 | 0.1 | 0.5 | 9.1 | 28.4 | 19.6 | 5.8 | 1.1 | 5.9 | 4.4 | 0.9 | 0.8 | 0.2 |
| 146999 | 122.5 | 158.8 | 471.6 | 37.4 | 53.3 | 173.8 | 17.8 | 52.0 | 0.1 | 0.7 | 8.7 | 31.9 | 27.5 | 6.2 | 1.9 | 4.9 | 3.8 | 1.3 | 1.0 | <LOD |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 146999 | 122.5 | 158.8 | 471.6 | 37.4 | 53.3 | 173.8 | 17.8 | 52.0 | 0.1 | 0.7 | 8.7 | 31.9 | 27.5 | 6.2 | 1.9 | 4.9 | 3.8 | 1.3 | 1.0 | <LOD |
| 154810 | 114.4 | 183.0 | 434.9 | 32.5 | 76.6 | 177.3 | 17.7 | 60.2 | 0.2 | 0.5 | 11.3 | 30.7 | 20.2 | 7.3 | 1.6 | 5.2 | 3.9 | 1.9 | 2.9 | <LOD |
| 175633 | 121.8 | 164.9 | 506.4 | 40.8 | 68.5 | 195.7 | 20.3 | 64.9 | 0.3 | 0.7 | 11.8 | 34.4 | 27.2 | 8.9 | 1.9 | 7.0 | 5.5 | 1.3 | 1.4 | 0.3 |
| 146772 | 108.3 | 163.4 | 327.4 | 38.4 | 65.3 | 189.9 | 19.9 | 69.6 | 0.3 | 0.5 | 13.0 | 41.7 | 31.3 | 6.4 | 2.1 | 9.3 | 5.6 | 2.7 | 2.2 | 0.2 |
| 150427 | 118.8 | 205.0 | 419.3 | 48.2 | 53.7 | 209.1 | 25.2 | 78.2 | 0.3 | 0.9 | 14.6 | 41.6 | 33.0 | 7.8 | 2.1 | 7.4 | 5.7 | 1.8 | 2.5 | 0.5 |
| 160331 | 104.7 | 193.7 | 208.8 | 46.2 | 63.8 | 207.8 | 24.9 | 100.3 | 0.4 | 0.6 | 16.7 | 46.8 | 35.2 | 11.8 | 2.4 | 9.5 | 4.1 | 2.2 | 2.5 | 0.7 |
| 152645 | 92.2 | 188.8 | 273.3 | 41.1 | 76.6 | 203.9 | 25.9 | 83.5 | 0.3 | 1.2 | 14.8 | 49.4 | 31.9 | 12.4 | 2.2 | 10.6 | 6.1 | 2.3 | 3.1 | 0.3 |
| 154493 | 93.8 | 256.4 | 218.6 | 45.4 | 69.1 | 222.9 | 27.6 | 93.7 | 0.4 | 0.9 | 15.8 | 50.9 | 46.7 | 14.3 | 2.4 | 8.1 | 7.6 | 4.3 | 2.5 | 0.3 |
| 162211 | 94.7 | 265.0 | 137.2 | 52.2 | 67.1 | 224.8 | 32.6 | 97.3 | 0.5 | 0.8 | 18.8 | 54.5 | 43.6 | 15.4 | 2.4 | 8.2 | 7.6 | 4.2 | 4.2 | 0.3 |
| 160020 | 87.0 | 293.7 | 79.2 | 47.3 | 85.7 | 221.5 | 33.9 | 105.4 | 0.5 | 0.9 | 17.6 | 60.3 | 50.7 | 10.3 | 2.7 | 10.3 | 5.7 | 4.0 | 2.5 | 0.5 |
| 162957 | 81.6 | 271.5 | 70.3 | 48.2 | 61.4 | 227.4 | 35.5 | 95.4 | 0.5 | 0.7 | 19.3 | 58.0 | 46.6 | 11.7 | 2.0 | 10.5 | 6.8 | 3.3 | 4.3 | 0.4 |
| 159797 | 86.9 | 263.0 | 57.5 | 49.6 | 69.7 | 215.2 | 34.9 | 102.3 | 0.4 | 0.9 | 19.8 | 61.1 | 46.4 | 14.9 | 2.8 | 9.2 | 9.1 | 3.7 | 2.7 | 0.4 |
| 161800 | 89.8 | 284.7 | 67.7 | 43.5 | 92.1 | 224.6 | 38.4 | 101.0 | 0.5 | 0.9 | 19.0 | 63.9 | 56.3 | 14.0 | 3.6 | 9.8 | 7.4 | 4.6 | 4.6 | 0.6 |
| 165607 | 105.9 | 370.0 | 63.4 | 50.7 | 85.7 | 259.2 | 41.0 | 115.6 | 0.5 | 1.0 | 25.3 | 68.8 | 58.6 | 12.9 | 3.1 | 15.0 | 8.2 | 4.3 | 4.8 | 0.6 |
| 153918 | 88.3 | 313.4 | 42.1 | 48.3 | 67.8 | 215.8 | 36.4 | 98.1 | 0.4 | 0.7 | 20.6 | 66.6 | 49.5 | 16.2 | 2.2 | 12.6 | 6.4 | 3.5 | 2.9 | 0.6 |
| 144944 | 79.3 | 299.8 | 31.8 | 46.8 | 66.2 | 200.2 | 34.4 | 96.2 | 0.4 | 0.9 | 19.8 | 69.8 | 45.0 | 15.3 | 2.9 | 11.7 | 7.0 | 4.6 | 3.5 | 0.5 |
| 162684 | 79.5 | 317.5 | 37.9 | 48.7 | 58.0 | 219.6 | 35.2 | 103.1 | 0.3 | 0.8 | 22.8 | 65.7 | 64.1 | 13.8 | 3.4 | 10.0 | 9.4 | 4.8 | 4.4 | 0.4 |
| 154722 | 81.4 | 258.7 | 40.4 | 46.7 | 62.6 | 193.8 | 36.9 | 107.8 | 0.5 | 0.6 | 19.0 | 66.9 | 54.8 | 12.2 | 2.6 | 11.7 | 7.3 | 3.1 | 2.9 | 0.4 |
| 160613 | 85.0 | 288.7 | 26.9 | 44.7 | 49.8 | 199.1 | 35.9 | 105.3 | 0.5 | 0.7 | 20.3 | 69.2 | 58.0 | 14.1 | 2.7 | 11.8 | 9.8 | 4.6 | 2.7 | 0.4 |
| 156503 | 86.8 | 315.5 | 59.7 | 43.8 | 89.5 | 210.5 | 39.4 | 115.6 | 0.5 | 0.6 | 21.3 | 73.7 | 58.2 | 14.0 | 3.3 | 10.4 | 10.3 | 5.0 | 3.0 | 0.4 |
| 160939 | 94.3 | 334.9 | 54.8 | 46.2 | 66.0 | 217.3 | 41.2 | 110.8 | 0.6 | 0.6 | 20.4 | 72.2 | 52.8 | 14.3 | 3.7 | 9.4 | 8.0 | 3.7 | 3.3 | 0.4 |
| 158688 | 92.5 | 283.3 | 66.4 | 47.1 | 52.3 | 199.7 | 36.1 | 127.3 | 0.6 | 0.8 | 19.4 | 64.3 | 50.0 | 13.9 | 3.0 | 10.7 | 9.9 | 3.4 | 3.7 | 0.4 |
| 148870 | 97.1 | 297.0 | 138.6 | 47.9 | 67.3 | 221.5 | 37.5 | 113.7 | 0.6 | 3.0 | 24.0 | 69.6 | 51.8 | 14.4 | 2.9 | 10.9 | 8.8 | 3.2 | 2.3 | 0.6 |
| 168458 | 109.2 | 297.1 | 142.6 | 49.1 | 54.8 | 256.5 | 41.6 | 126.5 | 0.5 | 11.0 | 24.2 | 71.1 | 59.9 | 18.9 | 3.2 | 11.7 | 8.8 | 4.6 | 3.1 | 0.4 |
| 165323 | 97.6 | 314.8 | 197.9 | 49.4 | 53.9 | 292.0 | 37.1 | 115.4 | 0.7 | 31.0 | 21.5 | 67.5 | 57.3 | 13.5 | 2.4 | 10.3 | 9.1 | 3.5 | 3.7 | 0.3 |
| 143332 | 85.1 | 272.9 | 188.7 | 47.0 | 56.4 | 378.3 | 33.6 | 121.0 | 0.9 | 71.9 | 23.4 | 65.3 | 58.1 | 13.3 | 2.4 | 11.0 | 9.5 | 4.5 | 3.5 | 0.5 |
| 146023 | 90.0 | 254.1 | 138.4 | 38.4 | 42.9 | 396.1 | 32.9 | 102.8 | 1.2 | 136.3 | 19.1 | 60.3 | 41.9 | 11.8 | 2.7 | 9.1 | 6.8 | 2.3 | 3.0 | 0.3 |
| 143145 | 83.7 | 304.6 | 165.4 | 47.1 | 66.8 | 578.0 | 33.4 | 126.9 | 2.4 | 257.6 | 20.0 | 61.7 | 47.5 | 15.1 | 2.5 | 8.0 | 7.8 | 4.6 | 2.2 | 0.5 |
| 138271 | 81.7 | 238.3 | 124.0 | 37.4 | 37.7 | 643.5 | 33.5 | 125.5 | 3.6 | 363.2 | 19.0 | 54.1 | 33.5 | 11.2 | 2.0 | 10.8 | 6.5 | 2.9 | 2.4 | 0.3 |
| 127615 | 70.5 | 254.9 | 144.0 | 31.8 | 61.1 | 837.7 | 26.6 | 122.9 | 6.4 | 529.8 | 20.0 | 55.2 | 36.5 | 12.3 | 3.1 | 9.3 | 6.3 | 2.7 | 2.4 | 0.4 |
| 126679 | 67.6 | 300.9 | 98.8 | 33.0 | 21.9 | 992.4 | 24.7 | 107.5 | 8.1 | 689.1 | 18.6 | 50.6 | 40.2 | 8.2 | 1.9 | 6.0 | 4.5 | 1.5 | 1.6 | 0.4 |
| 116641 | 52.3 | 263.4 | 100.5 | 35.4 | 31.6 | 1169.0 | 24.6 | 111.3 | 9.8 | 884.8 | 17.7 | 46.4 | 39.9 | 9.2 | 2.1 | 4.5 | 4.7 | 1.5 | 1.2 | 0.3 |
| 84743 | 40.3 | 230.8 | 38.7 | 24.6 | 17.7 | 1128.8 | 17.8 | 94.6 | 9.0 | 934.0 | 13.4 | 32.6 | 22.1 | 4.5 | 2.0 | 4.9 | 3.6 | 1.3 | 0.6 | 0.1 |
| 74023 | 23.4 | 225.0 | 42.2 | 25.5 | 13.9 | 1119.0 | 13.6 | 77.3 | 9.7 | 1060.1 | 11.9 | 30.8 | 13.2 | 3.5 | 1.5 | 2.6 | 2.6 | 1.2 | 0.6 | 0.4 |
| 46526 | 19.3 | 141.2 | 31.4 | 12.2 | 10.2 | 1105.7 | 10.1 | 70.0 | 11.6 | 1013.8 | 11.9 | 21.1 | 6.9 | 3.0 | 1.3 | 2.6 | 1.2 | 0.6 | 0.5 | <LOD |
| 38879 | 18.8 | 225.4 | 0.0 | 14.3 | 7.6 | 942.3 | 7.9 | 87.9 | 18.6 | 1167.7 | 14.0 | 21.8 | 10.4 | 2.1 | 1.5 | 2.7 | 1.4 | 0.9 | <LOD | 0.2 |
| | | | | | | | | | | AT16.3track2 | | | | | | | | | | |
| Ca43 | Sc45 | V51 | Cr53 | Co59 | Ni60 | Sr88 | Y89 | Zr90 | Nb93 | Ba138 | La139 | Ce140 | Nd146 | Sm149 | Eu153 | Gd157 | Dy163 | Er166 | Yb172 | Lu175 |
| 166204 | 80.0 | 275.2 | 199.9 | 56.6 | 55.3 | 227.2 | 36.3 | 125.3 | 1.7 | 2.3 | 26.9 | 74.9 | 64.7 | 16.5 | 2.9 | 11.1 | 7.0 | 3.6 | 3.6 | 0.3 |
| 149113 | 80.4 | 303.9 | 249.4 | 48.5 | 72.7 | 201.1 | 38.1 | 116.2 | 1.3 | 1.7 | 24.2 | 67.8 | 52.9 | 12.7 | 2.9 | 11.6 | 9.5 | 4.1 | 3.8 | 0.3 |
| 162846 | 86.5 | 274.3 | 150.4 | 40.1 | 83.2 | 224.7 | 40.8 | 113.1 | 1.1 | 1.3 | 25.3 | 69.8 | 55.1 | 11.9 | 2.9 | 11.5 | 7.1 | 3.6 | 3.9 | 0.6 |
| 145728 | 86.5 | 233.7 | 197.2 | 41.8 | 49.9 | 198.5 | 33.3 | 99.1 | 0.8 | 1.0 | 22.1 | 60.7 | 46.9 | 10.0 | 1.9 | 10.5 | 6.5 | 3.6 | 2.6 | 0.4 |
| 165260 | 93.4 | 240.4 | 259.3 | 41.8 | 79.9 | 211.8 | 36.3 | 105.1 | 0.7 | 0.8 | 24.1 | 65.5 | 51.4 | 10.4 | 2.7 | 11.8 | 9.8 | 4.1 | 2.7 | 0.5 |
| 171480 | 101.3 | 252.9 | 206.8 | 49.8 | 69.5 | 219.4 | 37.2 | 114.8 | 0.7 | 0.8 | 21.4 | 68.2 | 55.8 | 11.3 | 4.1 | 14.6 | 9.3 | 3.5 | 3.9 | 0.4 |
| 165801 | 93.7 | 268.6 | 151.1 | 44.3 | 67.1 | 232.2 | 38.9 | 103.1 | 0.6 | 0.5 | 21.2 | 75.2 | 58.7 | 16.8 | 2.1 | 12.4 | 10.8 | 3.7 | 3.3 | 0.4 |
| 165902 | 84.9 | 270.3 | 338.4 | 43.8 | 59.8 | 191.3 | 36.8 | 99.4 | 0.7 | 0.6 | 20.8 | 68.0 | 46.3 | 10.8 | 2.6 | 9.7 | 6.9 | 5.3 | 2.6 | 0.4 |
| 164914 | 98.3 | 309.9 | 178.4 | 54.0 | 63.0 | 198.4 | 33.2 | 99.7 | 0.7 | 0.5 | 19.0 | 65.7 | 53.9 | 12.9 | 3.0 | 11.1 | 10.9 | 3.4 | 3.5 | 0.4 |
| 182966 | 91.4 | 261.4 | 146.8 | 51.8 | 51.1 | 211.7 | 35.7 | 101.5 | 0.5 | 0.5 | 23.6 | 72.3 | 49.6 | 14.2 | 2.7 | 11.4 | 6.3 | 4.8 | 3.3 | 0.6 |
| 160958 | 77.0 | 270.8 | 112.3 | 54.0 | 61.9 | 234.2 | 34.6 | 93.1 | 0.7 | 0.3 | 21.5 | 62.7 | 49.6 | 11.3 | 3.3 | 10.8 | 9.0 | 3.0 | 3.0 | 0.4 |
| 156930 | 83.9 | 279.7 | 56.6 | 48.6 | 56.7 | 199.3 | 31.7 | 91.8 | 0.7 | 0.3 | 17.2 | 58.9 | 46.2 | 11.5 | 2.1 | 8.9 | 5.9 | 4.2 | 2.5 | 0.6 |
| 168670 | 79.6 | 254.9 | 61.9 | 46.0 | 48.1 | 217.0 | 35.1 | 87.0 | 0.6 | 0.4 | 18.2 | 68.1 | 50.7 | 11.0 | 2.6 | 8.8 | 8.1 | 3.8 | 2.1 | 0.8 |
| 144492 | 78.6 | 300.3 | 76.4 | 35.5 | 72.8 | 211.9 | 37.8 | 91.5 | 0.7 | 0.5 | 19.6 | 61.6 | 41.5 | 12.4 | 2.8 | 11.4 | 8.1 | 3.2 | 2.6 | 0.3 |
| 171087 | 80.6 | 285.0 | 61.3 | 48.5 | 55.4 | 218.0 | 33.6 | 86.6 | 0.6 | 0.4 | 18.7 | 64.3 | 46.0 | 15.3 | 2.5 | 12.2 | 7.2 | 3.5 | 3.4 | 0.4 |
| 143729 | 72.4 | 279.9 | 53.7 | 39.9 | 68.4 | 205.2 | 34.0 | 88.0 | 0.6 | 0.4 | 18.2 | 62.8 | 46.2 | 14.0 | 2.7 | 10.3 | 4.9 | 4.0 | 3.9 | 0.6 |
| 141768 | 78.7 | 303.6 | 52.1 | 43.7 | 61.7 | 201.6 | 36.1 | 100.4 | 0.7 | 0.4 | 19.4 | 63.9 | 41.8 | 13.9 | 2.7 | 10.4 | 8.0 | 3.8 | 3.5 | 0.4 |
| 157875 | 82.2 | 295.3 | 35.7 | 51.5 | 48.1 | 209.3 | 37.8 | 101.0 | 0.7 | 0.5 | 22.3 | 65.7 | 53.2 | 13.0 | 2.7 | 11.3 | 10.2 | 4.5 | 3.1 | 0.3 |
| 161395 | 77.9 | 298.9 | 60.7 | 45.3 | 59.4 | 220.4 | 37.3 | 97.5 | 0.5 | 0.5 | 22.9 | 69.5 | 54.3 | 16.6 | 2.5 | 10.2 | 8.1 | 3.6 | 3.4 | 0.7 |
| 161379 | 74.2 | 279.4 | 45.8 | 35.5 | 46.0 | 196.2 | 34.7 | 88.3 | 0.5 | 0.4 | 17.1 | 60.9 | 48.8 | 14.6 | 2.5 | 9.6 | 7.3 | 2.7 | 2.2 | 0.4 |
| 156897 | 84.8 | 333.2 | 23.3 | 48.8 | 65.4 | 213.3 | 37.0 | 99.9 | 0.5 | 0.4 | 22.7 | 68.7 | 50.3 | 11.6 | 2.7 | 11.0 | 6.0 | 3.4 | 2.4 | 0.5 |
| 175247 | 80.2 | 306.9 | 43.6 | 47.8 | 57.7 | 216.6 | 38.0 | 99.7 | 0.6 | 0.5 | 17.7 | 65.6 | 54.9 | 13.3 | 2.9 | 10.6 | 6.8 | 2.8 | 3.9 | 0.7 |
| 165683 | 86.8 | 305.3 | 18.2 | 55.3 | 60.8 | 209.3 | 39.3 | 97.8 | 0.7 | 0.5 | 20.9 | 66.5 | 48.2 | 14.0 | 2.8 | 12.1 | 9.1 | 3.7 | 3.5 | 0.7 |
| 148081 | 78.0 | 298.0 | 32.0 | 43.1 | 68.3 | 212.0 | 36.7 | 100.9 | 0.7 | 0.4 | 21.6 | 69.5 | 53.6 | 14.1 | 2.6 | 12.1 | 10.0 | 4.3 | 2.8 | 0.4 |
| 156170 | 78.4 | 319.4 | 36.6 | 47.8 | 47.0 | 210.7 | 36.7 | 98.5 | 0.4 | 0.4 | 18.8 | 67.3 | 58.5 | 14.6 | 2.4 | 10.2 | 6.9 | 3.4 | 3.5 | 0.4 |
| 163472 | 82.4 | 321.8 | 38.3 | 46.4 | 47.1 | 227.7 | 39.2 | 110.1 | 0.6 | 0.4 | 22.7 | 66.0 | 51.5 | 13.4 | 2.5 | 17.3 | 8.6 | 3.6 | 3.9 | 0.5 |
| 178572 | 96.4 | 299.2 | 35.0 | 59.8 | 76.2 | 228.0 | 37.3 | 106.6 | 0.6 | 0.5 | 19.4 | 68.5 | 57.2 | 13.8 | 2.6 | 11.5 | 7.7 | 4.6 | 3.6 | 0.5 |
| 169415 | 87.9 | 302.2 | <LOD | 62.3 | 59.5 | 220.0 | 40.5 | 112.0 | 0.7 | 0.4 | 20.6 | 64.4 | 53.6 | 15.0 | 2.5 | 11.0 | 7.7 | 2.9 | 2.3 | 0.4 |
| 189504 | 85.8 | 311.9 | 68.9 | 53.4 | 65.9 | 218.4 | 38.6 | 108.3 | 0.8 | 0.4 | 18.9 | 69.9 | 54.9 | 16.2 | 3.1 | 11.0 | 7.8 | 4.0 | 3.4 | 0.4 |
| 158933 | 83.7 | 265.0 | 68.1 | 44.5 | 60.4 | 223.0 | 41.5 | 112.5 | 0.5 | 0.4 | 19.8 | 63.5 | 57.3 | 13.4 | 2.9 | 10.2 | 7.2 | 2.8 | 2.6 | 0.5 |
| 158109 | 82.4 | 282.1 | 58.0 | 53.5 | 61.3 | 217.6 | 33.3 | 105.7 | 0.5 | 0.5 | 22.1 | 62.4 | 49.3 | 14.5 | 2.9 | 11.2 | 7.0 | 3.0 | 3.9 | 0.6 |
| 163595 | 84.0 | 267.1 | 57.9 | 44.7 | 62.0 | 230.7 | 35.8 | 105.6 | 0.6 | 0.4 | 18.2 | 65.1 | 48.0 | 11.8 | 2.8 | 12.7 | 10.5 | 2.8 | 3.0 | 0.6 |
| 182649 | 90.2 | 293.5 | 84.7 | 48.1 | 67.2 | 236.5 | 36.9 | 108.7 | 0.7 | 0.4 | 20.8 | 68.9 | 49.2 | 16.1 | 2.6 | 10.1 | 8.0 | 4.3 | 2.8 | 0.5 |
| 170633 | 77.9 | 283.1 | 64.4 | 46.1 | 50.7 | 224.3 | 34.4 | 103.6 | 0.4 | 0.4 | 18.1 | 54.9 | 48.7 | 12.2 | 2.4 | 10.2 | 8.6 | 3.5 | 1.7 | 0.3 |
| 146944 | 74.2 | 260.1 | 48.7 | 47.7 | 74.3 | 218.4 | 33.5 | 98.6 | 0.6 | 0.4 | 17.8 | 57.2 | 51.3 | 13.3 | 2.4 | 11.1 | 7.1 | 3.3 | 3.5 | 0.3 |
| 173096 | 80.6 | 277.5 | 34.9 | 46.8 | 76.9 | 227.4 | 38.0 | 96.7 | 0.4 | 0.5 | 18.6 | 64.0 | 49.9 | 11.2 | 2.4 | 11.4 | 6.6 | 3.3 | 2.8 | 0.4 |
| 166307 | 83.8 | 269.2 | 37.9 | 41.9 | 63.8 | 225.2 | 36.2 | 97.5 | 0.5 | 0.4 | 18.2 | 59.2 | 42.0 | 10.7 | 2.7 | 10.4 | 8.0 | 3.0 | 2.6 | 0.4 |
| 171121 | 102.3 | 250.7 | 58.8 | 51.9 | 87.0 | 263.0 | 39.9 | 106.5 | 0.7 | 0.4 | 19.6 | 68.0 | 49.0 | 11.9 | 3.0 | 11.5 | 6.0 | 3.8 | 1.9 | 0.6 |
| 157028 | 91.8 | 257.5 | 35.3 | 46.4 | 49.2 | 227.0 | 37.6 | 98.2 | 0.5 | 0.4 | 18.9 | 58.9 | 49.4 | 11.6 | 2.5 | 9.4 | 8.0 | 3.6 | 2.8 | 0.4 |
| 152104 | 91.8 | 260.5 | 96.0 | 52.3 | 62.3 | 233.6 | 33.6 | 94.5 | 0.5 | 0.4 | 18.5 | 59.2 | 46.8 | 13.5 | 2.7 | 8.7 | 6.8 | 3.3 | 2.1 | 0.2 |
| 151663 | 94.6 | 259.5 | 143.4 | 49.9 | 87.1 | 223.2 | 32.1 | 93.7 | 0.4 | 0.6 | 19.3 | 55.8 | 39.8 | 11.7 | 2.1 | 10.6 | 5.8 | 3.3 | 2.7 | 0.4 |
| 170579 | 110.5 | 196.6 | 357.1 | 47.4 | 67.5 | 225.9 | 32.8 | 91.8 | 0.3 | 0.3 | 16.8 | 51.2 | 43.0 | 10.6 | 3.1 | 8.2 | 8.3 | 2.3 | 2.8 | 0.3 |
| 174297 | 106.0 | 207.0 | 380.9 | 45.4 | 51.9 | 226.5 | 26.3 | 66.9 | 0.3 | 0.4 | 13.8 | 47.8 | 41.2 | 8.7 | 2.2 | 8.8 | 6.4 | 1.7 | 1.0 | 0.4 |
| 173348 | 111.0 | 192.0 | 466.4 | 40.2 | 75.1 | 206.6 | 25.4 | 58.3 | 0.3 | 0.3 | 12.8 | 43.8 | 30.5 | 9.1 | 1.9 | 5.8 | 4.7 | 2.4 | 1.2 | 0.3 |
| 159975 | 105.1 | 165.8 | 608.9 | 41.3 | 82.5 | 210.3 | 24.2 | 52.0 | 0.3 | 0.3 | 12.0 | 40.9 | 29.4 | 7.1 | 1.9 | 5.8 | 4.9 | 2.1 | 2.7 | 0.3 |
| 159218 | 129.0 | 140.2 | 658.9 | 40.6 | 65.3 | 186.5 | 20.7 | 45.4 | 0.2 | 0.3 | 12.9 | 35.7 | 32.9 | 8.5 | 1.7 | 7.0 | 3.9 | 2.3 | 1.3 | 0.4 |
| 155739 | 107.3 | 127.0 | 578.4 | 34.8 | 53.0 | 173.4 | 19.9 | 48.3 | 0.2 | 0.3 | 11.2 | 34.4 | 32.1 | 6.4 | 1.9 | 7.3 | 4.5 | 2.0 | 0.9 | 0.1 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 159908 | 117.6 | 139.2 | 650.5 | 36.0 | 79.2 | 187.0 | 20.5 | 45.9 | 0.2 | 0.2 | 11.0 | 35.1 | 27.7 | 6.4 | 1.5 | 6.0 | 3.4 | 3.5 | 1.6 | 0.2 |
| 167209 | 114.8 | 133.1 | 715.3 | 36.1 | 84.0 | 188.3 | 17.4 | 40.7 | 0.2 | 0.4 | 11.8 | 35.0 | 28.7 | 6.8 | 2.2 | 6.8 | 4.6 | 2.2 | 1.3 | 0.2 |
| 157707 | 123.9 | 137.1 | #### | 33.8 | 60.7 | 183.7 | 19.2 | 35.5 | 0.1 | 0.4 | 10.3 | 30.2 | 26.6 | 8.4 | 2.0 | 6.5 | 3.5 | 1.5 | 0.9 | 0.2 |
| 155718 | 120.7 | 137.7 | 820.2 | 36.4 | 65.9 | 176.3 | 14.7 | 37.4 | 0.1 | 0.4 | 9.5 | 27.6 | 26.1 | 8.3 | 1.6 | 6.3 | 3.7 | 2.0 | 1.0 | 0.3 |
| 158849 | 143.0 | 133.9 | 739.0 | 41.3 | 80.0 | 192.3 | 16.9 | 35.3 | 0.2 | 0.4 | 9.7 | 29.4 | 28.8 | 6.3 | 1.4 | 6.8 | 4.6 | 1.2 | 1.3 | 0.2 |
| 152020 | 119.3 | 115.4 | 620.7 | 33.3 | 77.2 | 175.7 | 15.1 | 33.6 | 0.2 | 0.2 | 8.5 | 28.2 | 26.9 | 5.2 | 1.6 | 5.3 | 3.8 | 1.4 | 2.5 | 0.1 |
| 156338 | 105.8 | 118.4 | 797.6 | 36.1 | 73.9 | 190.4 | 15.9 | 41.2 | 0.3 | 0.3 | 10.5 | 27.7 | 27.8 | 7.4 | 1.7 | 5.9 | 2.2 | 1.6 | 1.5 | 0.1 |
| 163558 | 117.6 | 152.8 | 556.8 | 38.9 | 69.8 | 199.4 | 18.0 | 55.2 | 0.3 | 0.5 | 12.2 | 36.3 | 31.6 | 7.2 | 1.8 | 7.7 | 6.2 | 2.7 | 1.6 | 0.2 |
| 165255 | 113.8 | 158.8 | 689.8 | 38.9 | 67.4 | 198.4 | 19.9 | 65.8 | 0.3 | 0.5 | 13.0 | 40.9 | 31.7 | 9.6 | 1.7 | 5.7 | 6.0 | 2.3 | 1.4 | 0.3 |
| 171369 | 117.1 | 188.3 | 510.8 | 39.2 | 101.5 | 226.3 | 26.7 | 80.3 | 0.4 | 0.4 | 15.1 | 49.9 | 45.3 | 9.9 | 2.4 | 9.2 | 9.0 | 2.1 | 1.8 | 0.2 |
| 162051 | 93.4 | 185.0 | 263.0 | 33.9 | 78.5 | 195.4 | 28.4 | 81.9 | 0.3 | 0.3 | 19.8 | 59.3 | 45.2 | 12.4 | 2.4 | 10.6 | 6.7 | 3.0 | 2.3 | 0.5 |
| 176748 | 95.0 | 197.3 | 206.9 | 51.6 | 95.9 | 218.8 | 36.6 | 100.4 | 0.6 | 0.5 | 19.9 | 64.0 | 48.6 | 14.8 | 3.3 | 11.7 | 6.7 | 4.2 | 3.5 | 0.3 |
| 167943 | 100.4 | 241.1 | 215.2 | 45.9 | 70.0 | 233.6 | 36.4 | 133.0 | 0.5 | 0.5 | 23.7 | 72.2 | 50.3 | 14.5 | 2.8 | 9.8 | 9.8 | 4.4 | 3.4 | 0.5 |
| 185504 | 95.2 | 274.5 | 126.4 | 48.9 | 101.1 | 232.1 | 43.1 | 121.3 | 0.4 | 0.6 | 22.4 | 72.0 | 56.3 | 12.9 | 3.0 | 10.4 | 7.1 | 3.6 | 4.5 | 0.7 |
| 167387 | 85.7 | 280.6 | 62.8 | 46.1 | 83.1 | 214.9 | 38.4 | 128.7 | 0.6 | 0.6 | 20.6 | 68.3 | 56.7 | 15.5 | 3.0 | 12.0 | 8.3 | 3.3 | 4.3 | 0.4 |
| 157443 | 78.7 | 217.4 | 55.0 | 48.3 | 106.6 | 210.7 | 37.0 | 113.1 | 0.6 | 0.5 | 20.6 | 67.7 | 55.3 | 13.0 | 2.8 | 12.4 | 8.0 | 4.0 | 2.6 | 0.4 |
| 159528 | 88.0 | 288.7 | 55.7 | 43.6 | 98.7 | 221.8 | 43.0 | 129.0 | 0.5 | 0.5 | 21.7 | 71.2 | 58.5 | 13.6 | 2.6 | 9.8 | 9.7 | 5.0 | 2.8 | 0.5 |
| 156847 | 81.4 | 263.1 | 53.8 | 44.0 | 92.2 | 237.2 | 40.1 | 125.3 | 0.6 | 0.5 | 21.1 | 75.9 | 64.3 | 19.0 | 3.2 | 12.1 | 8.5 | 4.1 | 3.9 | 0.6 |
| 165882 | 87.8 | 274.7 | 40.5 | 46.3 | 110.9 | 234.7 | 41.4 | 125.1 | 0.6 | 0.7 | 25.7 | 73.4 | 55.5 | 13.3 | 3.5 | 16.4 | 9.5 | 4.9 | 5.2 | 0.5 |
| 167186 | 88.9 | 258.8 | 64.2 | 44.1 | 79.5 | 231.1 | 42.5 | 127.9 | 0.6 | 0.6 | 25.6 | 75.0 | 61.3 | 18.7 | 2.9 | 13.4 | 6.6 | 4.7 | 5.8 | 0.4 |
| 142126 | 87.5 | 273.2 | 103.3 | 45.9 | 81.0 | 220.1 | 38.5 | 122.3 | 0.7 | 0.8 | 25.7 | 76.6 | 56.2 | 12.2 | 3.1 | 17.0 | 5.4 | 2.4 | 3.0 | 0.4 |
| 168753 | 90.3 | 262.3 | 178.0 | 41.8 | 75.8 | 223.3 | 35.0 | 115.3 | 0.6 | 0.7 | 23.8 | 64.3 | 49.1 | 14.3 | 2.9 | 9.4 | 8.3 | 3.9 | 3.3 | 0.6 |
| 169746 | 96.7 | 223.9 | 319.8 | 40.3 | 100.4 | 229.4 | 32.2 | 104.4 | 0.6 | 0.6 | 19.0 | 62.9 | 46.8 | 11.4 | 2.1 | 7.8 | 8.2 | 3.2 | 2.2 | 0.5 |
| 160895 | 99.1 | 206.1 | 251.8 | 37.0 | 103.1 | 217.3 | 28.2 | 97.3 | 0.4 | 0.4 | 13.5 | 50.5 | 39.7 | 9.5 | 1.7 | 8.9 | 7.0 | 2.2 | 2.2 | 0.3 |
| 159304 | 87.2 | 181.1 | 385.7 | 41.3 | 78.0 | 189.1 | 24.0 | 70.0 | 0.5 | 0.5 | 15.2 | 43.5 | 37.3 | 6.8 | 2.0 | 8.1 | 4.9 | 2.6 | 3.0 | 0.3 |
| 164526 | 108.2 | 184.3 | 319.1 | 39.5 | 64.7 | 206.1 | 23.2 | 64.1 | 0.4 | 0.5 | 10.9 | 40.8 | 27.0 | 6.0 | 2.0 | 6.8 | 4.6 | 2.3 | 2.0 | 0.2 |
| 158128 | 92.4 | 162.2 | 277.7 | 42.3 | 69.2 | 176.8 | 20.4 | 46.5 | 0.3 | 0.4 | 10.9 | 33.7 | 29.9 | 8.5 | 1.1 | 7.2 | 4.4 | 2.2 | 0.8 | 0.2 |
| 179777 | 102.5 | 165.7 | 458.6 | 42.5 | 83.9 | 187.7 | 19.5 | 55.1 | 0.2 | 0.4 | 11.2 | 29.5 | 28.6 | 6.0 | 1.6 | 6.4 | 4.7 | 1.9 | 1.4 | 0.2 |
| 163250 | 105.1 | 139.7 | 336.2 | 40.8 | 62.9 | 189.4 | 19.0 | 51.2 | 0.1 | 0.5 | 9.4 | 29.8 | 24.4 | 7.5 | 1.3 | 5.3 | 3.5 | 2.2 | 1.9 | 0.3 |
| 175394 | 108.8 | 146.4 | 356.9 | 40.8 | 78.2 | 203.1 | 17.1 | 49.8 | 0.2 | 0.5 | 9.1 | 33.1 | 23.5 | 6.5 | 1.1 | 6.1 | 4.8 | 2.2 | 1.1 | 0.3 |
| 153646 | 92.3 | 132.6 | 429.3 | 40.6 | 82.3 | 179.0 | 17.9 | 42.3 | 0.2 | 0.4 | 8.8 | 26.0 | 26.7 | 5.8 | 1.7 | 5.2 | 3.9 | 1.9 | 2.0 | <LOD |
| 166650 | 113.2 | 146.9 | 324.1 | 36.6 | 91.1 | 179.1 | 16.0 | 49.1 | 0.2 | 0.4 | 8.9 | 31.1 | 25.0 | 5.1 | 1.2 | 7.6 | 5.3 | 2.2 | 1.7 | 0.3 |
| 160260 | 97.9 | 142.3 | 406.5 | 42.7 | 51.9 | 183.8 | 16.6 | 45.6 | 0.2 | 0.4 | 9.7 | 29.9 | 24.1 | 6.9 | 1.4 | 6.0 | 4.0 | 2.0 | 1.1 | 0.1 |
| 184684 | 103.2 | 159.3 | 401.2 | 47.6 | 90.0 | 185.1 | 19.8 | 48.9 | 0.2 | 0.8 | 10.5 | 36.3 | 27.5 | 7.9 | 1.7 | 6.8 | 4.7 | 1.5 | 0.8 | 0.4 |
| 164807 | 105.9 | 174.6 | 231.8 | 43.5 | 63.5 | 188.7 | 18.9 | 47.0 | 0.3 | 0.6 | 10.4 | 34.7 | 27.7 | 6.6 | 1.9 | 7.6 | 4.8 | 1.8 | 1.4 | 0.3 |

Table G4: Complete list of data produced through LA-ICP-MS analysis for transects across the zoned cpx phenocrysts

| | ATHO | | AT13 & PCLava | AT2 | AT12 & AT16 |
|---|---|---|---|---|---|
| | usgs cert | +- | atho | atho | atho |
| **Sc45** | 5 | 0.8 | 9 | 9 | 9 |
| **V51** | 3.91 | 0.34 | 3.95 | 4.08 | 4.00 |
| **Cr53** | 6.1 | 1.4 | <LOD | <LOD | <LOD |
| **Co59** | 2.13 | 0.47 | 1.60 | 1.60 | 1.65 |
| **Ni60** | 13 | 5 | 11 | 11 | 11 |
| **Sr88** | 94.1 | 2.7 | 95.3 | 95.1 | 95.5 |
| **Y89** | 94.5 | 3.5 | 91.5 | 91.5 | 92.7 |
| **Zr90** | 512 | 20 | 494 | 498 | 501 |
| **Nb93** | 62.4 | 2.6 | 56.6 | 57.2 | 57.2 |
| **Ba138** | 547 | 16 | 544 | 546 | 549 |
| **La139** | 55.6 | 1.5 | 54.9 | 55.4 | 55.8 |
| **Ce140** | 121 | 4 | 120 | 121 | 121 |
| **Nd146** | 60.9 | 2 | 60.2 | 61.7 | 61.2 |
| **Sm149** | 14.2 | 0.4 | 14.6 | 14.2 | 14.6 |
| **Eu153** | 2.76 | 0.1 | 2.63 | 2.63 | 2.63 |
| **Gd157** | 15.3 | 0.7 | 14.2 | 14.4 | 14.8 |
| **Dy163** | 16.2 | 0.7 | 16.5 | 16.8 | 16.5 |
| **Er166** | 10.3 | 0.5 | 10.1 | 10.1 | 10.3 |
| **Yb172** | 10.5 | 0.4 | 10.5 | 10.2 | 10.4 |
| **Lu175** | 1.54 | 0.05 | 1.55 | 1.52 | 1.55 |
| | **StHs6/80** | | **AT13 & PCLava** | **AT2** | **AT12 & AT16** |
| | **usgs cert** | **+-** | **sths6/80** | **sths6/80** | **sths6/80** |
| **Sc45** | 11.5 | 0.8 | 12.7 | 12.7 | 12.3 |
| **V51** | 90.3 | 6.7 | 84.8 | 85.2 | 84.2 |
| **Cr53** | 16.9 | 3.3 | 36.9 | 28.7 | 35.2 |
| **Co59** | 13.2 | 1.1 | 13.0 | 13.1 | 12.9 |
| **Ni60** | 23.7 | 3.8 | 20.2 | 20.7 | 21.0 |
| **Sr88** | 482 | 8 | 487 | 496 | 485 |
| **Y89** | 11.4 | 0.4 | 11.4 | 11.6 | 11.3 |
| **Zr90** | 118 | 3 | 118.3 | 119.6 | 118.4 |
| **Nb93** | 6.94 | 0.25 | 6.33 | 6.52 | 6.38 |
| **Ba138** | 298 | 9 | 296 | 301 | 296 |
| **La139** | 12 | 0.3 | 12 | 12 | 12 |
| **Ce140** | 26.1 | 0.7 | 25.0 | 25.6 | 25.0 |
| **Nd146** | 13 | 0.3 | 12 | 13 | 13 |
| **Sm149** | 2.78 | 0.05 | 2.89 | 2.81 | 2.81 |
| **Eu153** | 0.953 | 0.022 | 0.902 | 0.944 | 0.917 |
| **Gd157** | 2.59 | 0.09 | 2.53 | 2.51 | 2.32 |
| **Dy163** | 2.22 | 0.06 | 2.28 | 2.18 | 2.23 |
| **Er166** | 1.18 | 0.04 | 1.22 | 1.31 | 1.19 |
| **Yb172** | 1.13 | 0.03 | 1.19 | 1.21 | 1.17 |
| **Lu175** | 0.168 | 0.006 | 0.193 | 0.212 | 0.202 |

Table G5: Details of the secondary standards (atho and sths6/80) run during the transects of the zoned cpx phenocrysts along with the USGS certified values for the standards